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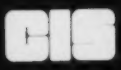

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CONGRESSIONAL BUDGET OFFICE

AUGUST 1988

Including Capital Expenses in the Prospective Payment System

A SPECIAL STUDY

INCLUDING CAPITAL EXPENSES IN THE PROSPECTIVE PAYMENT SYSTEM

The Congress of the United States
Congressional Budget Office

NOTES

Unless otherwise indicated, all years referred to in the text are fiscal years.

Details in the text and tables of this report may not add to totals because of rounding.

The cover photographs were provided by the University of Minnesota Health Sciences Center.

PREFACE

At the time the Congress established the prospective payment system (PPS) for inpatient hospital service, payments for capital-related expenses were not included in the new system. This study was conducted by the Congressional Budget Office (CBO) in response to a request by the Subcommittee on Health and the Environment of the Committee on Energy and Commerce, made soon after passage of the PPS legislation. The report examines the advantages and disadvantages of prospective payment for capital costs, the effects of such a change on the financial condition of hospitals, and the impacts of various policies that would provide a transition to a prospective system.

The study was done by Jack Rodgers of CBO's Human Resources and Community Development Division under the direction of Nancy M. Gordon and Stephen H. Long. Jodi Korb, also of the Human Resources and Community Development Division, programmed the PPS simulations for the study. The appendix on the PPS was prepared by Jack Rodgers and Steven Sheingold.

Many others contributed to the study. Staff at the Prospective Payment Assessment Commission--in particular, Bruce Steinwald, Candy Littell, and Laura Dummit--commented on an earlier draft of the study report. Professor Gerard F. Anderson of the Johns Hopkins University also commented on an earlier draft. Carla Pedone, Emily Santer, and Jenifer Wishart made many useful suggestions. Lisa Simonson provided research assistance.

Paul L. Houts edited the manuscript, Antoinette Foxx typed portions of various drafts, and Nancy H. Brooks prepared the final draft for publication.

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SUMMARY

In 1983, the Congress changed Medicare's system of paying for inpatient hospital services from a retrospective, cost-based reimbursement system to a prospective payment system (PPS). Under this system, a hospital receives a payment for each patient discharged that reflects the complexity of the case but is not related to its actual operating costs. The Congress believed the new system would alleviate two serious problems caused by Medicare's previous cost-based reimbursement system: inefficiency and lack of budget control. Payments for capital-related expenses, however, were not included in the PPS, and they continued to be paid on a cost basis. This exclusion was based on the concern that--because of the long lives of many investment projects--hospitals might not be able to make the necessary adjustments fast enough to avoid serious financial problems.

CAPITAL COSTS AND THE CAPITAL CYCLE

Capital costs are those recurring expenses for hospitals associated with the use of capital--including interest, depreciation, return on equity, rent, and costs of leasing equipment. These costs represent a continuing flow that should not be confused with a hospital's stock of physical capital--the buildings, plant, land, and equipment--or the financial assets and liabilities of a hospital.

Capital costs are much more apt to vary than operating costs, as a result of what is termed the "capital cycle." Interest expenses are high in the early years after a hospital investment project is completed, but they decline as the principal is repaid. Total capital costs--composed of these declining interest costs and constant depreciation costs--fall over time. Recently completed investment projects are also likely to have much higher capital costs for yet another reason: construction and equipment costs were usually higher at the time the most recent projects were undertaken.

Despite their high variability, inpatient capital costs have only a modest influence on the level and variability of total inpatient costs. In 1984, for example, they represented only 8.6 percent of total inpatient costs.

ADVANTAGES AND DISADVANTAGES OF INCLUDING CAPITAL PAYMENTS IN THE PPS

The current system for reimbursing hospitals for capital costs has several serious problems:

- Capital-related expenses are not accurately measured, and their correct apportionment to Medicare patients is difficult to determine;
- Hospitals are not encouraged to be economical in purchasing or leasing capital; and
- Medicare payments for capital are not under direct federal control.

Incorporating capital costs into the PPS would not solve the first problem: determining the appropriate prospective payment would be just as complicated as estimating capital costs under the current system. Including capital costs in the PPS would, however, respond to the problems of inefficiency and lack of budget control. Since Medicare payments would be based on the number of patients discharged rather than the costs of treatment, any reductions a hospital decides to make in its capital spending would not lower its reimbursement from Medicare. For this reason, hospitals would probably make more efficient use of capital under the PPS. In addition, the Medicare program would be better able to control payments for capital under the PPS. Total payments would grow only to the extent that the PPS rate, total discharges, or case complexity increased.

Because of these advantages, the Congress has indicated its intention to pay prospectively for capital costs in the future. Including capital costs in the PPS would have some disadvantages, however. The most obvious one is that some hospitals might not be able to ad-

just to a system in which payments for capital would not rise and fall with capital costs. Another, less obvious problem is that such a change would reinforce the incentives under the current system to avoid treating certain patients and to discharge patients earlier than medically desirable.

IS A TRANSITION POLICY NEEDED?

Even if most hospitals could eventually adjust to the new system, establishing it immediately might cause some hospitals to receive large percentage windfall gains or losses in reimbursements for capital costs in the short run. These changes would be closely related to whether a hospital was at a low or at a high stage of the capital cost cycle.

Under one illustrative method of including capital costs in the PPS simulated in this study, more than 60 percent of all hospitals would have received higher Medicare payments for capital in 1984 than under the cost-based reimbursement system, assuming their behavior was unchanged. On the other hand, about 25 percent of hospitals would have received at least 20 percent less compared with cost-based reimbursement. If the analysis had assumed that hospitals could have reduced their costs in response to prospective payment, the proportion of losers would have been lower. In fact, because hospitals would have incentives to be more economical in their use of capital under prospective payment, the analysis overstates the losses and understates the gains. A system that was designed to be budget neutral, for example, might actually increase the average profit margins of hospitals compared with cost-based reimbursement because of the behavioral responses.

How, then, do the potential disruptions of including capital in the PPS compare with those that were projected under the PPS for operating costs? To answer this question, the Congressional Budget Office (CBO) compared the change in reimbursement that would have resulted from including capital costs in the PPS with the change that would have been caused by immediately paying prospectively for operating costs in 1984. In both cases, it was assumed that hospitals did not change their behavior. The change in payments for capital

costs, absolutely or as a percentage of total Medicare payments, would generally have been smaller than the corresponding change in payments for operating costs. For example, only one hospital in thirteen would have had changes in payments for capital greater than $200 per discharge compared with two out of three hospitals that would have had changes in payments for operating costs at least that large.

OPTIONS FOR TRANSITION TO PPS

Transition policies attempt to provide relief for at least some of the hospitals that would receive less if capital payments were included in the PPS immediately. Such policies present a trade-off between equity and efficiency. Although financial problems would be eased for some hospitals, the incentives for more economic behavior would be reduced as well. Three transition options are analyzed in this study:

- *Blend Prospective Amounts with Hospital-Specific Costs.* This transition policy--patterned after the transition for operating costs under PPS--would base payments for capital costs to each hospital on a weighted average of the PPS rate for capital and each hospital's actual costs in a base period. The proportion of the payment based on hospital-specific amounts would decline each year, and the proportion based on the PPS rate would rise, until the payment for capital was fully prospective.

- *Pay More for Exceptionally High Costs--That Is, for "Outliers."* Such a policy would concentrate on providing relief to hospitals with the highest capital costs. Only hospitals with capital costs above some threshold amount would receive outlier payments.

- *"Grandfather" Existing Capital.* Under this policy, cost-based reimbursement would be continued for capital in place before a specific date. Capital projects finished after that date would be reimbursed under the PPS.

These transition policies could be designed so that Medicare's total payments for capital costs would be the same as, higher than, or lower than under cost-based reimbursement. Similarly, payments for capital could be reduced or increased without a transition policy. This study compares various transition policies, cost-based reimbursement, and immediate establishment of prospective payment. At the same time, it holds the level of spending constant--in other words, by imposing budget neutrality. Most of the following discussion is based on this convenient assumption.

COMPARING TRANSITION OPTIONS

Each of the three transition options has distinct advantages and disadvantages. For example, blending would have several appealing features. The proportion of payments determined by cost-based reimbursement would be higher in the earlier years before the hospitals had time to adjust and lower in later years. Blending--having been part of the PPS for operating costs--would be easy for hospital administrators and the intermediaries who pay hospitals on behalf of Medicare to understand.

On the other hand, blending would provide relief to many hospitals whose losses under PPS would be quite small. Other hospitals with very high capital costs would receive only partial relief, especially in later years. Depending on the length of the transition, relief might also be provided to hospitals that began expensive capital projects years after 1983, when the Congress stated its intent to pay for capital on a prospective basis.

Outlier payments, restricted to the hospitals with the highest costs, would have the advantage that most hospitals would move to fully prospective payment immediately. Thus, the advantages of greater efficiency would be achieved immediately for most hospitals. Furthermore, relief to hospitals with the highest costs would be much larger--especially in later years--compared with a budget-neutral blending policy.

One disadvantage of outlier policies--especially generous ones that would last many years--is that hospitals with the highest costs would have weaker incentives to look for ways to reduce capital costs than they would have under blending policies. Outlier payments would also raise an equity issue: should relief from PPS be concentrated on hospitals with the highest costs when some of them are probably the least efficient in the industry?

Grandfather policies are appealing because they would limit relief from PPS to those hospitals whose capital costs are based on previous commitments. After completing a major capital project, hospitals may find it difficult to alter their capital costs for many years. Hospitals contemplating further expansions or renovations would do so after considering the effects of prospective payment for capital.

The chief disadvantage of carrying out a grandfather policy would be the arbitrariness of any specific cutoff date. Because of the length of hospital planning cycles, hospitals may not complete projects for many years after the commitment is made. No matter what the cutoff date, some hospitals would receive very different capital payments compared with other, almost identical hospitals.

CHAPTER I

CAPITAL AND MEDICARE'S REIMBURSEMENT FOR CAPITAL COSTS

Medicare's prospective payment system (PPS)--established in October 1983 by Public Law 98-21--provides a system of payments that are not related to actual hospital operating costs. Instead, a hospital receives a payment for each patient discharged that reflects the complexity of the case. If this payment is lower than actual costs, the hospital must absorb the loss; if the payment is higher, the hospital is allowed to keep the difference. (See the appendix for a more complete discussion of the Medicare PPS. For specific definitions of terms used in this report, see the glossary.)

The Congress enacted the PPS to alleviate two serious problems caused by Medicare's previous cost-based reimbursement system:

- *Inefficiency.* The incentives for hospitals to reduce costs were not strong since their revenues were, in fact, determined by costs. The more a hospital spent, the more it received from the Medicare program. On the other hand, if a hospital succeeded in reducing its costs, its Medicare payments were cut.

- *Lack of Budget Control.* The federal government had no control over how much was paid for services delivered to Medicare patients. In essence, by deciding how much to spend, the individual hospital determined how much it would be paid by Medicare.

When the PPS was enacted, however, the lump-sum PPS payment did not include certain costs--in particular, those relating to capital (for example, the use of capital facilities and equipment, including depreciation and interest expenses). These costs continued to be paid under the old cost-based reimbursement system.

Capital was excluded from the Medicare PPS based on two perceptions:

- The large variation in capital costs among hospitals would require some of them to make a larger adjustment than what would be needed for operating costs; and
- Hospitals might not be able to make the necessary adjustments fast enough to avoid serious financial problems.

On the other hand, the Congress has repeatedly stated its intention to incorporate capital costs into the PPS. Doing so has two goals--to develop incentives for hospitals to be economical in their use of capital funds and to reduce the growth rate of Medicare's outlays for capital. Neither of these effects is certain, of course, since both depend on the way capital costs would be paid.

Because payments for capital under an expanded PPS would not necessarily match actual capital-related expenses, it might affect the ability of some hospitals to support their capital needs, while providing others with substantially greater reimbursement than their actual costs warranted. Moreover, reducing payments for capital could result in some hospital foreclosures or lower the quality of care for some Medicare beneficiaries. Although the hospital industry has expanded vigorously since World War II, its growth has slowed in recent years, and the number of hospital closings has increased (see Box 1). One important issue to be resolved in designing a new payment system for capital would be how to move from the cost-based one to a system that pays prospectively, without creating serious problems for certain hospitals and beneficiaries, and that has as little adverse effect as possible on the federal budget deficit during the transition period.

CAPITAL, CAPITAL COSTS, AND THE CAPITAL CYCLE

A hospital's capital is a term used broadly to refer to both the physical (durable) assets of a hospital, including the buildings, plant, land, and equipment. Capital costs are those recurring costs associated with the use of capital--including interest, depreciation, return on equity, taxes, insurance, rent, and costs of leasing.

The difference between capital and capital costs is a distinction between a stock and a flow. Capital refers to the stock of land, buildings, and equipment. Capital costs refer to the flow of costs associated with the use of the capital stock. Yet another concept--capital expenditure or investment--refers to a change in the capital stock.

The Nature of Capital Costs

The nature of capital costs is illustrated by the following example. Consider an established hospital that is buying a large piece of equipment--for example, a magnetic resonance imager (MRI) that costs $1 million and is expected to have a 10-year useful life span. If the hospital were to borrow $1 million for 10 years at an interest rate of 10 percent to purchase the MRI, the annual loan repayment would be $162,745 (see Table 1). During the first year, the payment would consist of $100,000 in interest and $62,745 in principal. The interest payments would decline each year, reaching $14,795 in the tenth year; at the same time, the contribution to principal would rise each year until it reached $147,950 in the tenth year when the loan would be fully repaid. Interest costs would average $62,745 over the 10-year period.

If the MRI did not wear out or become obsolete, the interest costs would be the only costs of owning the machine. Since the machine has an expected useful life of 10 years, the $1 million must be included as an additional capital cost. A common convention for depreciation accounting--the straight-line method--is to distribute the costs evenly across the useful life of the asset. For the MRI, this method would result in annual depreciation costs of $100,000.

If the MRI were financed this way, for the first year the total capital costs would be $200,000 for interest payments and depreciation; they would, however, be less in each successive year, reaching $114,795 in the tenth year. The average annual capital costs would be $162,745, which is identical to the constant annual loan repayment amount (see Table 1).

Capital costs are not the same as cash outlays, however. In the example where the hospital borrows to finance the MRI, the interest and

BOX 1
THE HOSPITAL INDUSTRY SINCE 1946

During the post-World War II period, the hospital industry underwent steady and vigorous expansion. Recently, however, this trend appears to have ended, and given this changing environment hospitals are now confronting uncertainty about future developments. But whether hospitals are really entering a new era or just experiencing a period of temporary turbulence is still too early to determine.

THE POST-WAR EXPANSION

Increases in the number of hospitals, their output, and the intensity of care they provide reflect the general expansion of the hospital industry (see the adjacent figures). For example, the number of hospitals grew 35 percent from 4,444 in 1946 to a high of 5,979 in 1975, the number of beds per capita increased by 32 percent between 1946 and 1977, and hospital admissions per capita rose 64 percent between 1946 and 1980.

The intensity of care in hospitals--as measured by full-time equivalent (FTE) staff per bed, payroll per admission, and expenses per admission--continued to soar through 1986, the most recent year for which data are available. Since 1946, FTEs per bed grew by 189 percent, payroll per admission (in 1986 dollars) increased 676 percent, and expenses per admission rose more than 804 percent.

Occupancy rate and the average length of stay (ALOS) had more erratic patterns of change. Between 1946 and 1983, occupancy rates hovered between 72 percent and 79 percent. ALOS also fell and rose, but overall it declined from a high of 9.1 days per admission in 1946 to 7.1 days per admission in 1986.

These trends have been affected by three major forces:

Private Hospital Insurance. Increased coverage for hospital expenses by private health insurance has led to a greater demand for a broader range of medical services. Private hospital insurance covered less than 10 percent of the population in 1940, but about 80 percent in 1975.

Government Programs. Federal legislation has increased both the supply of and demand for hospital services. Hospital expansion was subsidized by programs such as Hill-Burton (Public Law 79-725), which provided direct support for the construction of hospitals. Moreover, with the passage of Medicare and Medicaid in 1965, demand for hospital services, particularly by the elderly and those with the lowest incomes, increased.

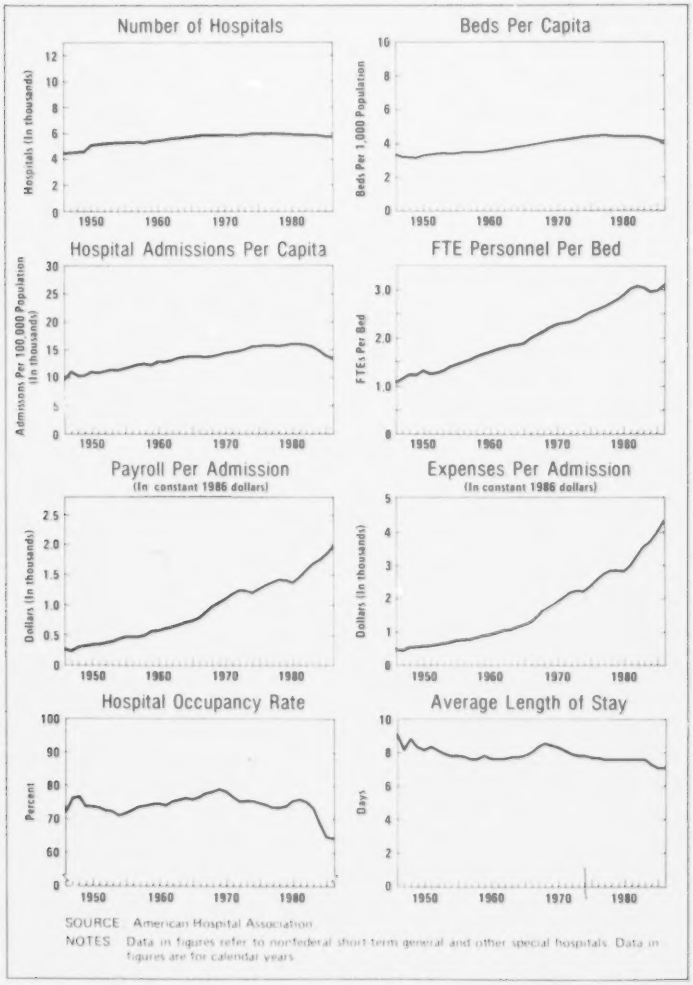
Technological Change. A surge in technological advancements has led to shorter, but more intensive hospital stays. New techniques frequently require more highly trained staff--and more of them--as well as greater use of other resources per admission.

RECENT FLUCTUATIONS

The historical pattern of general growth in the hospital industry, however, does not apply to the recent period in which the intensity of care continued to grow, but hospital use declined. FTE per bed, payroll per admission, and expenses per admission reached their highest levels in 1986. At the same time, the number of hospitals, beds per capita, and admissions per capita have all declined, while occupancy rates and ALOS are both at a post-war low.

Hospitals face still another new situation. Cutbacks in government funding and cost controls imposed by private-sector payers limit resources for health services. Health maintenance organizations and other alternative delivery systems--which are thought to reduce hospital admissions per capita--are growing rapidly.

Under these conditions, some hospitals are closing. The American Hospital Association reported a record of 79 community hospital closings in 1987 and attributed this outcome to an unstable economic environment. Yet, expenses per admission continue to rise as hospitals try to raise their patient load by offering physicians the benefits of additional services, new technology, and better staffing in the face of declining demand for hospital care.



SOURCE: American Hospital Association.

NOTES: Data in figures refer to nonfederal short-term general and other special hospitals. Data in figures are for calendar years.

depreciation costs of $200,000 would be considerably higher than the cash outlays of $162,745 in the first year, while the reverse would be true in later years. For example, in the tenth year the interest and depreciation costs of $114,795 would be considerably less than the cash outlays of $162,745.

Suppose, instead, that the hospital had enough assets to finance the MRI without borrowing. In that case, the hospital would lose the amount it could have earned on the investments that would be liquidated in order to purchase the equipment--10 percent, or $100,000 during the first year--if the hospital earns the same interest rate as it must pay to borrow. Because the MRI pays for itself over time, the hospital would gradually recoup its liquidated investments and restore its lost interest earnings. These lost interest earnings--known as return on equity--would be equivalent to interest on borrowed funds. Since depreciation is not affected by the way the purchase is financed, the hospital would "pay," on average, $162,750 annually for the MRI.

TABLE 1. REPAYMENT SCHEDULE FOR A 10-YEAR LOAN (In dollars)

Year	Total Payment	Interest	Principal
1	162,745	100,000	62,745
2	162,745	93,725	69,020
3	162,745	86,823	75,922
4	162,745	79,231	83,514
5	162,745	70,880	91,866
6	162,745	61,693	101,052
7	162,745	51,588	111,157
8	162,745	40,472	122,273
9	162,745	28,245	134,500
10	162,745	14,795	147,950
10-Year Average	162,745	62,745	100,000

SOURCE: Congressional Budget Office calculations based on $1 million loan at 10 percent annual rate of interest.

Finally, consider the case in which the hospital leased or rented the MRI. In this example, the leasing company would charge an annual fee--such as $162,750--from which it would pay interest and depreciation. Even though the hospital would not own the capital good--the MRI--its capital costs would not be very different.

Most often, hospitals face more complex choices than those in the above example. For one thing, the costs of borrowing, owning, and leasing are not usually identical. For instance, the typical hospital must pay a higher interest rate when it borrows compared with the highest rate that it can earn on savings. The costs of for-profit hospitals are further influenced by provisions of the tax code--for instance, borrowing, owning, and leasing have distinct tax effects. Furthermore, loans and bond issues may be arranged with a wide assortment of repayment schemes with related differences in interest costs. The fact remains, however, that the use of a piece of capital equipment entails average annual costs of roughly the same magnitude no matter how those services are obtained, although the cash payments in any year may vary considerably.

A final note on this topic: the concept of capital costs in this study is based on accounting convention rather than economic theory. Economists, for example, would base depreciation allowances on replacement instead of historical costs. Medicare, however, bases its reimbursement on historical costs, following the accounting definition of capital costs.

The Capital Cycle

Capital costs are much more apt to vary--relative to median or average capital costs--than is the case for operating costs. On the other hand, capital costs are a much smaller share of total costs compared with operating costs.

Hospitals' Costs in 1984. Data from the 1984 Medicare cost report show that average hospital inpatient costs per case--the sum of operating and capital costs excluding return on equity--was $2,631 (see Table 2). Operating costs with a median of $2,395 accounted for 91.4 percent of inpatient costs. Capital costs with a median of $195 per

case represented only 8.6 percent of the total. Not surprisingly, then, the distributions of operating costs and of total costs were similar.

The operating and capital components of total inpatient costs per case differed substantially from each other (see Figure 1). Almost half--45 percent--of all hospitals had per case operating expenses that were within 25 percent of the median. Also, fewer than one out of 20 hospitals had operating costs greater than 300 percent of the median.

On the other hand, capital costs were subject to relatively greater variability. The absolute variation in capital costs per case--as measured by the standard deviation--was actually less than that for operating costs ($194 versus $1,155). At the same time, the relative variation--as measured by the coefficient of variation--was considerably larger for capital costs compared with operating costs (78.1 percent versus 44.0 percent).

TABLE 2. SELECTED STATISTICS ON HOSPITAL INPATIENT COSTS (For fiscal year 1984)

	Medicare Inpatient Costs Per Discharge (In dollars)		
	Total [a]	Operating	Capital
Median [b]	2,631	2,395	195
Mean [c]	2,872	2,623	249
Standard Deviation	1,264	1,155	194
Coefficient of Variation [d]	44.0	44.0	78.1

SOURCE: Congressional Budget Office calculations based on the 1984 Medicare Cost Report File.

a. Total costs are defined as the sum of operating and capital-related costs. The largest exclusion is the cost of direct graduate medical education.

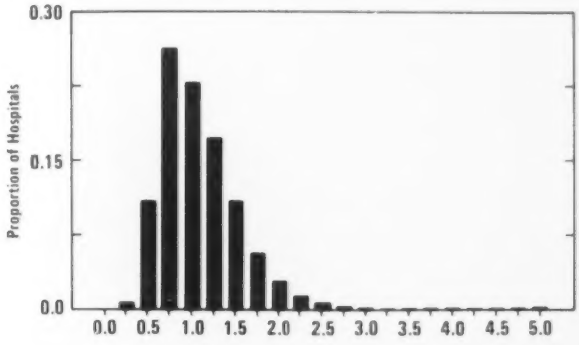
b. These figures reflect the use of hospital weights. The discharge-weighted median is $253 for capital, $2,947 for operating, and $3,238 for total costs per discharge. Median operating costs and median capital costs do not generally add to median total cost.

c. These figures reflect the use of hospital weights. The discharge-weighted mean is $288 for capital, $3,076 for operating, and $3,364 for total costs per discharge.

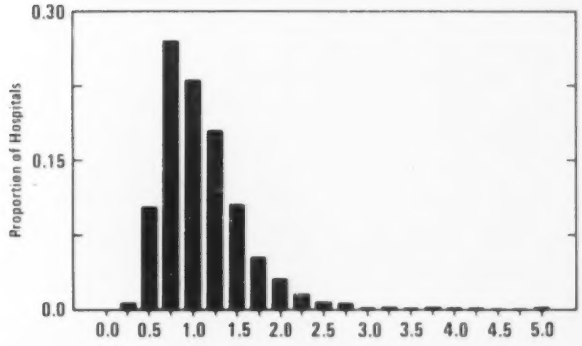
d. The coefficient of variation is defined as the ratio of the standard deviation to the mean.

Figure 1.
Distribution of Hospital Medicare Costs Per Discharge

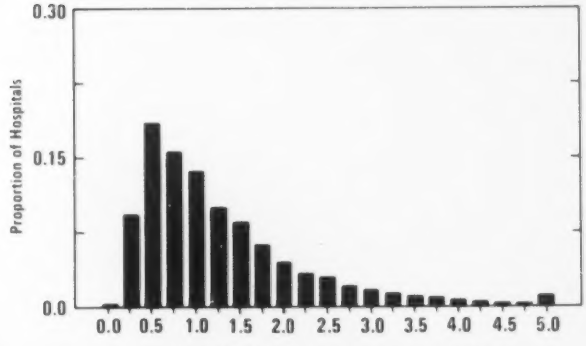
Total Costs [a, b]
(Scaled so that Median = 1.0)



Operating Costs [a]
(Scaled so that Median = 1.0)



Capital Costs [a]
(Scaled so that Median = 1.0)



SOURCE: Congressional Budget Office calculations based on the 1984 Medicare hospital cost report file.
[a] The top interval—labeled 5.0—includes all hospitals with costs greater than 4.875 times the median.
[b] Total costs are the sum of operating and capital costs.

Comparatively few hospitals had capital costs near the median; only one in four had capital costs within 25 percent of the median. In fact, for one out of 10 hospitals, capital costs in 1984 were at least $586, or 300 percent of the median.

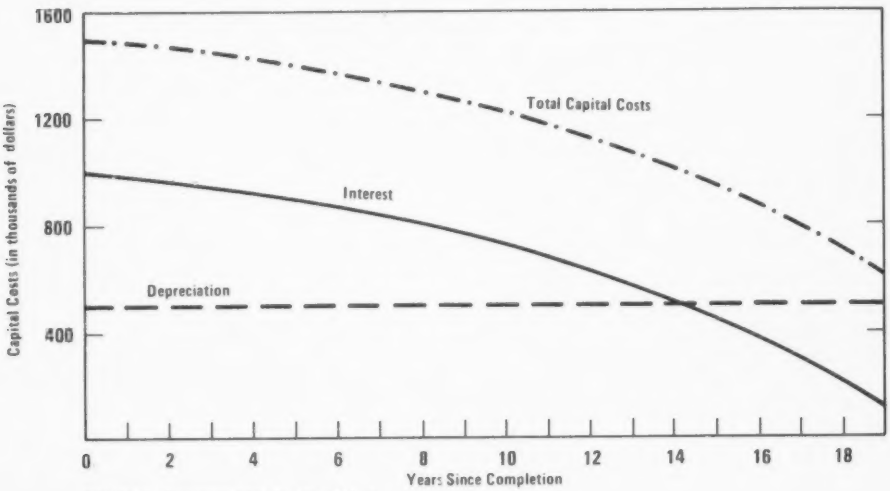
The Capital Cycle. This higher variability of capital costs compared with operating costs can be explained in part by what is termed the "capital cycle." Total capital costs vary in a predictable pattern throughout the useful life of capital goods. During the early years, a mortgage payment consists of high interest costs and a small repayment of principal (which incidentally, unlike depreciation, is not a cost of capital). The interest costs decline and repayment of principal increases each year until the mortgage is paid off. Since interest is a cost and repayment of principal is not, this type of capital cost decreases each year. In contrast, under straight-line accounting methods, depreciation is constant over the useful life of the asset. As a result, total capital costs also decline over time if the capital acquisition is financed by borrowing.

This relationship between an asset's age and capital costs is shown in Figure 2. The *interest* line represents declining interest costs over the years for the same facility. The *depreciation* line represents constant depreciation for a hospital with a facility that cost $10 million and has a useful life of 20 years--that is, $500,000 per year. Finally, the *total capital costs* line indicates the sum of interest and depreciation costs for each year since the capital project was completed. The costs decline from $1.5 million during the first year, to about $600,000 in the twentieth and final year after the project is completed. Capital costs are zero thereafter.

In addition to experiencing declining interest costs over any particular asset's life, a hospital with older assets probably acquired those assets at much lower costs than the hospital with a new physical plant. For example, if inflation in construction costs averaged 7 percent annually for 20 years, then the same facility that costs $10 million today would have cost only $2.6 million 20 years ago. Higher rates of inflation would make the difference even greater.

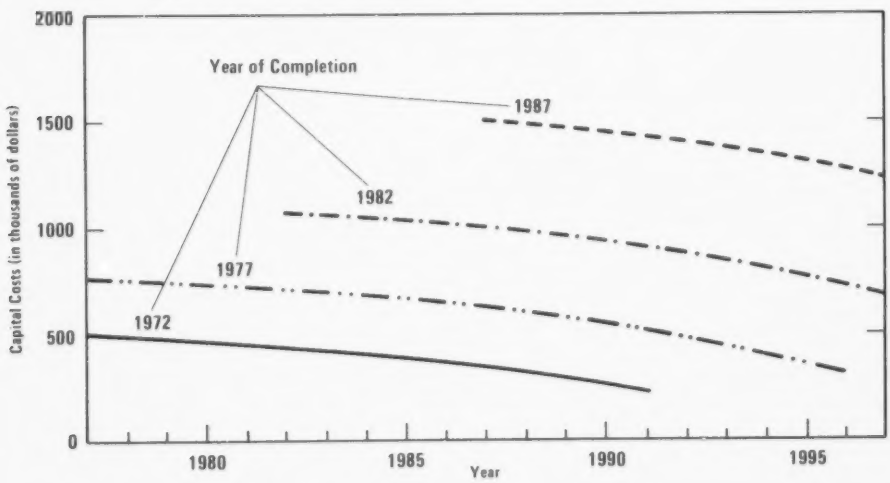
Figure 3 illustrates how the combination of these two forces--declining interest costs and increasing costs of construction--leads to

Figure 2.
Illustrative Life Cycle of Capital Costs



SOURCE: Congressional Budget Office.

Figure 3.
Illustrative Effect of Increasing Construction Costs on the Life Cycle of Capital Costs



SOURCE: Congressional Budget Office.

87-567 O - 88 - 2 : QL 3

much higher costs for newer hospitals. The lines labeled 1972, 1977, 1982, and 1987 represent total capital costs for the same type of facility completed in each of those years, assuming that construction costs grow 7 percent annually. Total capital costs during the first year after completion range from $543,669 for the facility completed in 1972 to $1.5 million for the one completed in 1987. Althougth these costs are intended to be illustrative, the pattern is similar for a wide variety of assumptions about useful lives, interest rates, and inflation in construction costs.

The differences among hospitals in total capital costs resulting from their capital cycles are not, however, usually as severe as this simple example suggests. For one thing, hospitals often have a complex combination of facilities--each with a different completion date. Furthermore, movable equipment has a shorter life span than buildings and is constantly being replaced. These two features suggest that the ratio of peak to trough (or high to low) capital costs is not as large as illustrated here.

Other Factors. The capital cycle is not the only source of variation in hospital capital costs. Construction costs, interest rates, and styles of medical practice vary across the country, from hospital to hospital, and from year to year. The presence of the capital cycle, however, implies that capital costs would be expected to vary considerably among similar types of hospitals in the same geographic area.

MEDICARE'S PAYMENT FOR CAPITAL-RELATED COSTS

Medicare reimburses hospitals based on the share of "reasonable" capital-related costs attributable to treating Medicare beneficiaries. Reasonable capital costs are defined to include interest, depreciation, leasing and rental expenses, some taxes and insurance expenses, and return on equity for investor-owned hospitals. Interest and depreciation are the largest capital-related costs; of the other smaller capital costs, return on equity has received more attention from the Congress. Medicare paid 96.5 percent of reasonable costs in 1987, but only 88 percent in 1988 and 85 percent in 1989.

Interest

Interest expense related to patient care is an allowable capital cost under Medicare. The interest must be necessary and proper--that is, it must be incurred on a financially necessary loan related to patient care, and it must be obtained from a lender unrelated to the borrower at a rate of interest that does not exceed what a prudent borrower would pay. With some exceptions, however, interest expenses must be reduced by investment income to be considered necessary. For example, consider the hospital that pays $90,000 in interest on a mortgage but earns $10,000 in interest on its money market account. Since the hospital could have used its money market balance to reduce its mortgage, it is recognized as having only $80,000 in necessary interest expense ($90,000 less $10,000). On the other hand, interest expense need not be reduced by investment income from gifts and grants, a provider's qualified pension fund, or funded depreciation (income from savings to replace worn out capital).

Depreciation

Medicare also reimburses hospitals for depreciation on buildings and equipment "used in the provision of patient care." Because physical assets decline in value as they age and eventually must be replaced, depreciation is recognized as a legitimate cost of doing business. Accordingly, accountants have developed several methods for prorating an asset's cost over its useful life. Generally, Medicare reimburses hospitals according to the straight-line depreciation method under which the annual depreciation cost is constant and equal to the acquisition cost less salvage value divided by the useful life of the asset. In an earlier example, the $1 million cost of the MRI was spread equally across its useful life of 10 years--$100,000 annually in depreciation costs--because its salvage value was assumed to be zero. Medicare reimbursement rules take into account, however, the possibility that the estimate of useful life may be inaccurate. For instance, if the MRI in the example were sold for $500,000 at the end of 10 years, Medicare would "recover" its share of the unexpected profit on the sale. Similarly, if the machine lasted only five years, the hospital could write off the undepreciated value of the MRI at the end of the fifth year.

Return on Equity

Under Medicare's reimbursement rules, proprietary hospitals receive a payment for their investment in the hospital. This payment (called return on equity) is similar to a rate of interest (called a rate of return) applied to the value of the investment. The rate of return is determined by the interest rate paid on the assets of the federal Hospital Insurance Trust Fund. The payment of return on equity to proprietary hospitals has been a subject of continuing controversy since Medicare was enacted in 1965. Most recently, under the provisions of the Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99-272), return-on-equity payments to hospitals were reduced by 25 percent in 1987, 50 percent in 1988, and 75 percent in 1989. After 1989, Medicare will not make payments for return on equity. (Unless otherwise noted, return-on-equity payments are excluded from all subsequent calculations in this report.)

Reductions in Payments

The Congress has enacted a series of across-the-board reductions in payments to hospitals for capital-related expenses. Under the Omnibus Reconciliation Act of 1986 (Public Law 99-509), each hospital's reasonable costs were reduced by 3.5 percent in 1987, 7.0 percent in 1988, and 10.0 percent in 1989. The Omnibus Budget Reconciliation Act of 1987 (Public Law 100-203) increased these cuts to a total reduction of 12 percent beginning in January 1988 and 15 percent in fiscal year 1989.

Problems under the Current System of Payment

The current system for reimbursing capital has several serious problems:

- Capital-related expenses are not accurately measured, and their correct apportionment to Medicare patients is difficult to determine;

- Hospitals are not encouraged to be economical in purchasing or leasing capital; and

- Medicare's payments for capital are not under federal control.[1]

Inaccurate Measurement of Medicare's Capital Costs. Under cost-based reimbursement, hospitals must estimate total capital-related expenses and then determine Medicare's share. Both steps in this process are subject to a great deal of uncertainty.

Two errors are apt to occur in measuring capital-related expenses, both of which lead to underestimating actual capital costs. First, depreciation expenses are based on historical costs rather than replacement costs. For example, a CAT scanner that cost $400,000 in 1980 might cost $1 million to replace in 1989. Its depreciation cost--based on a 10-year useful life--would be $40,000 in 1989. Alternatively, the depreciation cost calculated on the market cost of buying a new one would be $100,000. The difference between historical and replacement costs, although small in the first year after the investment, increases with each passing year.

Another factor that leads to underestimating capital costs is the way internally financed assets are treated under Medicare's reimbursement rules. If a hospital finances a capital project with its own funds, the hospital's implicit interest costs generally are not included in its cost calculations. If, instead, a hospital invests its internal funds in paper assets, the earnings usually are deducted from its interest costs. Therefore, its true interest costs tend to be underestimated.

Two exceptions must be noted. First, proprietary hospitals receive return-on-equity payments, but payments are to be eliminated after 1989. Second, hospitals are allowed to earn interest on funded depreciation, endowments, and pension assets.

Measuring a hospital's total capital costs is only the first step in determining Medicare's payment for them. The second step is to calculate Medicare's share. Under current regulations, the costs of routine services--that is, room and board--are apportioned on the basis of

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1. The discussion here notwithstanding, cost-based reimbursement does have advantages, especially for the hospital industry. For example, by reducing the risk from undertaking capital projects, cost-based reimbursement may make it easier for hospitals to borrow in financial markets. See Brian Kinkead, *Historical Trends in Hospital Capital Investment*, DHHS Contract No. HHS-100-820038 (Washington, D.C.: Urban Systems Research and Engineering, Inc., July 1984), pp. 22-28.

Medicare's share of total inpatient days, and costs of ancillary services--services other than room and board, and professional services--are apportioned on the basis of Medicare's share of total inpatient charges. These arbitrary accounting rules may not reflect the actual costs of treating Medicare's patients. For one thing, the apportionment rules do not take into account unused capital. Since hospital occupancy rates have been declining since 1981 and are now about 60 percent, Medicare's share would tend to be overstated when compared with the benefit received by patients. (They are correctly stated from the perspective of the hospital, however, since it actually incurred those costs.) The occupancy rate does not, however, immediately lead to an estimate of unused capacity since the unused beds may not be fully staffed or equipped.

Inefficiency. Critics of cost-based reimbursement for capital point out that the current system does not promote efficient investment decisions, in part because it insulates hospitals from the normal risks of business decisions. For example, because interest expense is reimbursed, hospitals may not act prudently--that is, they may not time their investments to periods of low interest rates or seek out the lowest possible interest rate. In addition, capital payments are not contingent on use; hospitals are reimbursed in full for depreciation and interest regardless of the occupancy rate. As a result, they are insulated from the negative effects of acquiring excess capital, such as underutilized facilities.

Yet, some hospitals--such as those with a high level of bad debt and charity care--may be unable to generate sufficient earnings through their operations and thus may be unable to borrow at a reasonable cost. Because the cost of equity financing for nonproprietary hospitals is not reimbursed, the present system provides little support to hospitals that cannot generate capital through loans or by issuing bonds. This lack of funds for necessary capital projects may result in inefficient or low-quality care for Medicare beneficiaries.

Finally, many policymakers are concerned that the PPS, which now pays for operating costs on a prospective basis and capital costs on a retrospective cost basis, encourages hospitals to operate inefficiently. In essence, the system creates an incentive for hospitals to favor capital expenditures--particularly those that lower operating costs--or

to substitute capital for operating expenses, even if the net effect is to raise total costs.

Of course, these incentives are strictly true only for the Medicare portion--about 40 percent--of hospital business. To the extent that hospitals are not reimbursed in this way by other payers, inefficient incentives are reduced.

Lack of Budget Control. Under cost-based reimbursement, individual hospitals decide how much capital to purchase and, ultimately, how much will be reimbursed for capital costs. However, since payments for capital are not closely related to services delivered, they could grow more rapidly than suggested by growth in admissions or the prices of other goods and services purchased by hospitals. This outcome is especially likely if hospitals respond to the incentives in the current law by substituting capital for labor.

In contrast, Medicare payments on the operating side are much more controllable because payment is limited to a fixed amount per case. Total payment for operating costs grows only to the extent that the amount per case increases, the total number of patients discharged increases, or the complexity of patients' ailments increases.

CHAPTER II

IMPLICATIONS OF INCLUDING CAPITAL PAYMENTS IN THE PPS

Moving from a cost-based reimbursement system for capital to a prospective one entails, among other things, making a trade-off between efficiency and stability for the hospital industry. On the one hand, prospective payment for capital would generally encourage the hospital industry to make more efficient use of capital and would, therefore, have the potential to reduce future expenditures for capital by Medicare and other payers. Moreover, the sooner a new system is established, the sooner these gains would be realized.

On the other hand, carrying out prospective payment immediately would create--at least in the short run--windfall gains for some hospitals and windfall losses for others. Unfortunately, it is not possible to quantify either the short-run or long-run gains in efficiency that would result from adopting a prospective payment system for capital. For that reason, this analysis is limited to the possible magnitude of hospitals' windfall gains and losses, as well as how quickly hospitals would be able to adjust to a new reimbursement system.

IS PROSPECTIVE PAYMENT FOR CAPITAL A GOOD IDEA?

Incorporating capital costs into an expanded PPS would deal with two major problems associated with cost-based reimbursement--inefficiency and lack of budget control. Since Medicare payments would be based on the number of patients discharged rather than the costs of treatment, any reductions a hospital decides to make in its capital spending would not lower its reimbursement from Medicare. For this reason, hospitals would probably make more efficient use of capital under the PPS. Moreover, the Medicare program would be better able to control payments for capital under an expanded PPS. The savings from prospective payment could go to Medicare beneficiaries, hospitals, or the federal treasury.

Including capital costs in the PPS would, however, have several disadvantages. For one thing, Medicare payments for capital would no longer rise and fall with capital costs. As a result, when a hospital's capital stock was old--meaning it had low capital costs--the hospital would have to save the excess payments to finance future renovations. Some hospitals might be unwilling or unable to do this. Furthermore, many lenders might be less willing to lend funds for new hospital projects under a system in which payments were not related to capital costs.

Even if most hospitals could eventually adjust to the new system in the long run, some hospitals would experience large percentage short-run windfall gains or losses in their reimbursements for capital costs. These changes would be closely related to whether a hospital was at a low or at a high stage of the capital cost cycle. Hospitals with low capital costs--and therefore large gains from PPS--could save their excess payments for the time when their costs would be larger than the PPS payments. Hospitals with large losses in capital payments--which would have had no such chance to save from previous excess PPS payments--might be forced to close in extreme cases.

Some hospital administrators might object to prospective payment--especially if applied to capital investments made under cost-based reimbursement--on grounds of fairness. They would argue that their high capital costs are the result of contracts entered into in good faith based on Medicare regulations in effect long before the advent of PPS. They would argue, furthermore, that the windfall gains of other hospitals would not be directly related to any additional services for Medicare beneficiaries.

Another, less-publicized problem of including capital in the PPS is that doing so would reinforce the weaknesses of the current PPS. The current system creates incentives for hospitals to avoid treating certain patients with complicated conditions and to discharge patients earlier than medically desirable--referred to in the popular press as "dumping" and as discharging patients "quicker and sicker." This incentive results from hospitals receiving little or no additional payments for treating especially complicated cases.[1] Expanding the PPS

1. Research on this type of behavior has not convincingly shown that the PPS lowers quality of care. For a survey of the evidence, see Health Care Financing Administration, *Impact of the Medicare*

would only exacerbate whatever tendencies hospitals may have toward these undesirable actions. Under the current system, a hospital with an especially complicated case receives additional payments for capital costs that were roughly proportional to the additional services performed. If capital costs were incorporated in PPS and capital payments costs were fixed for a given DRG (diagnosis related group), hospitals would have more incentive to avoid complicated cases.

Finally, cost-based and prospective reimbursement have one problem in common: no one knows for sure how much Medicare should pay hospitals for capital-related expenses. To set the initial prospective payment level for operating costs--known as the standardized amount--the current PPS used average historical costs. If this approach were used to set the prospective payment for capital, it would be subject to the same measurement and apportionment problems that plague cost-based reimbursement. The alternative--to base the prospective payment on how much would be needed to provide for the optimal amount of capital in the future--presents even greater estimation and measurement problems that could only be resolved after a substantial effort in data collection and research.

HOW FAST COULD HOSPITALS ADJUST TO PROSPECTIVE PAYMENT FOR CAPITAL?

A couple of simple examples will indicate the possible magnitude of changes in payments for capital costs for certain hospitals. A recently renovated hospital--that might have received $1,200 per case under cost reimbursement--might receive $400 per case under the new system. The reduction of $800 per case, or two-thirds of its capital costs, would represent approximately 17 percent of the hospital's total payments from Medicare, or roughly 7 percent of its entire budget for inpatient services if its other characteristics were typical. The financial effect could be larger or smaller depending on whether the hospital had more or less than the average proportion of Medicare patients, or a higher or lower ratio of capital to operating costs.

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care Hospital Prospective Payment System, 1985 Annual Report, HCFA Publication Number 03251 (Washington, D.C.: U.S. Department of Health and Human Services, August 1987).

On the other hand, a hospital with a somewhat older physical plant might have costs of $100 per case. The same prospective payment of $400 per case--representing an unexpected windfall of 300 percent in capital payments--might translate into 8 percent more total payments from Medicare, or a gain of about 3 percent of the entire hospital's inpatient budget. Again, the financial effect could be larger or smaller, depending on whether the hospital had more or less than the average proportion of Medicare patients, or a higher or lower ratio of capital to operating costs.

Whether changes of this magnitude would substantially alter the short-run financial picture for a hospital would depend on many factors. Certainly, some hospitals that are on the edge of bankruptcy might close because of a small loss under prospective payment, or alternatively, might be saved from bankruptcy by a small gain. At the same time, hospitals with large endowments or good financial ratings could survive large reductions in Medicare's payments. Other hospitals might go out of business even if they received large windfall gains from Medicare, especially considering the excess capacity that now exists in the hospital industry.

Moreover, these short-run gains and losses from capital costs being immediately included in the PPS must be assessed in the context of the capital cycle. Because capital costs for each hospital tend to decline with the age of physical plant and equipment, hospitals receiving less under prospective payment would tend to be those with recent renovations or expansions. In the years following inclusion of capital costs in the PPS, these hospitals would find their financial situation improving as their debts were retired and interest payments fell. Similarly, hospitals with windfall gains under prospective payment would probably be those with an older plant and equipment. Although their windfall gains would not be directly related to any additional services for Medicare beneficiaries, they could save the excess payments to replace worn-out buildings and equipment in the future; this would be, in fact, the intent of any system that pays for capital prospectively.

A complete analysis of the effects of immediate inclusion would have to take into account the behavioral responses of hospitals. Because hospitals under prospective payment would have incentives to be more economical in their use of capital, any analysis that does not capture these behavioral changes would tend to overstate the re-

ductions in payment and understate the gains. To the extent that hospitals would be able to adjust their capital expenses in response to a change in reimbursement, the analysis of short-run gains and losses under prospective payment overestimates the number of losers and the amount of their losses. Furthermore, if hospitals were to reduce costs, a system that was designed to be budget neutral might actually increase the profit margins of hospitals compared with cost-based reimbursement.

This type of adjustment actually took place under the PPS for operating costs, when hospitals promptly responded to the new payment rules. As a result, hospitals' operating costs grew more slowly than expected and profit margins increased under the PPS, especially during its first year.

Whether hospitals would adjust their capital spending to a new payment system as quickly as they did their operating costs is not readily apparent. Some capital goods--such as land and buildings--represent long-term commitments. For example, a hospital that wants a 25 percent smaller physical plant may wait 15 years (until the current one wears out) to build a new, smaller facility. Sometimes physical assets can be sold, but usually at much less than book value. Alternatively, unused space may be converted--at some additional cost--to uses other than inpatient care. In contrast, the costs of movable equipment--for example, X-ray machines and wheelchairs--can be adjusted faster because their expected lifetimes are generally shorter compared with plant and fixed equipment. Because of this difference between fixed and movable capital, adjustment to prospective payment might start quickly but continue over many years.

For the short run, hospitals could more easily reduce operating costs than they could capital spending. For example, they can lay off nurses and other hospital personnel, and can purchase lower-cost supplies as the current inventory is depleted. Although hospitals have some contracts with personnel and suppliers, they seldom exceed one year in duration. On the other hand, interest payments--representing about 40 percent of capital costs--might be reduced if capital were included in the PPS. Hospitals would have much stronger incentives to reduce interest costs--by refinancing at lower interest rates--under PPS compared with cost-based reimbursement. Of course, they would

have the opportunity to do so only if current interest rates were lower than those that prevailed when their loans were made.

A couple of alternative views of the relative length of capital and operating cycles are also plausible. For example, the early obsolescence of equipment and the need to maintain physical plants mean that the average effective life for hospital inpatient capital is quite short. Although hospital buildings may last many years, they require frequent major renovations to keep up with changes in technology and medical practice.

Another view of the operating cycle is that the use of personnel and supplies is closely related to the amount of physical plant and equipment. According to this view, because reductions in operating costs require major alterations in physical plant and equipment, capital and operating costs have closely related cycles.

Whether the experience of operating costs under the PPS would also be true for capital costs depends on which view of capital and operating cycles is correct. In any case, the possibility that capital costs would adjust quickly to a new payment system cannot be ruled out.

WHAT WOULD BE THE INITIAL EFFECTS OF IMMEDIATELY INCLUDING CAPITAL IN THE PPS?

To quantify the immediate effects of including capital costs in the PPS, a hypothetical PPS must be designed. The analysis in this chapter is structured the same way as payments for operating costs under the PPS, which are described in the Appendix. Standardized amounts for capital costs were computed separately for urban and rural hospitals so that each group would receive the same total amount as under cost-based reimbursement. These standardized amounts were adjusted for case complexity, for the high costs of patient care in hospitals with teaching programs or with higher proportions of low-income patients, as well as for "outliers"--that is, cases with extraordinarily high costs. These adjustments were based on the same formulas used in the current PPS for operating costs.

If capital costs were actually folded into the PPS, all of the adjustments would have to be reestimated because the current ones were calculated based on operating costs only. For example, the effects on capital costs of the ratio of the number of residents to the number of beds--the indirect teaching adjustment for capital--might be greater or less than that for operating costs alone. Such a carefully designed system based on an extensive study of factors affecting capital costs would almost certainly produce smaller differences between cost-based and prospective payment compared with the simpler approach taken in this study.

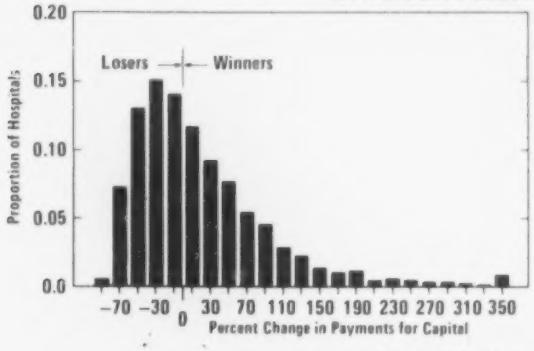
The initial effects of immediately including capital in the PPS were estimated from a simulation, based on 1984 data, of hospitals' experience under the illustrative system. If the prospective payments for capital were designed to be budget neutral--that is, if the average Medicare payments for capital costs were the same as under cost-based reimbursement--more than 60 percent of all hospitals would have received higher Medicare payments for capital in 1984 than they actually did (see the middle panel of Figure 4). More than half of all hospitals would have received at least 20 percent more under prospective payment than under cost-based reimbursement, and more than one-third of hospitals would have received at least 50 percent more.

The new system, of course, would have produced losers as well as winners. Under budget neutrality, 37 percent of all hospitals would have received lower prospective payments for capital compared with actual 1984 Medicare payments. Almost one hospital in four would have received at least 20 percent less, and about one in 11 hospitals would have received less than half of their actual reimbursements under the cost-based system.

The 1984 level of payments for capital costs was not, however, necessarily based on the optimal amount of investment in the hospital industry. Because the incentives under cost-based reimbursement would lead to too much capital, the appropriate amount of hospital inpatient capital would result in lower capital costs. In 1989, based on the reductions under current law, Medicare's capital payments will be 15 percent lower than actual capital costs. Thus, a budget neutral prospective system established that year or later would automatically provide less funding for capital than the illustrative system examined

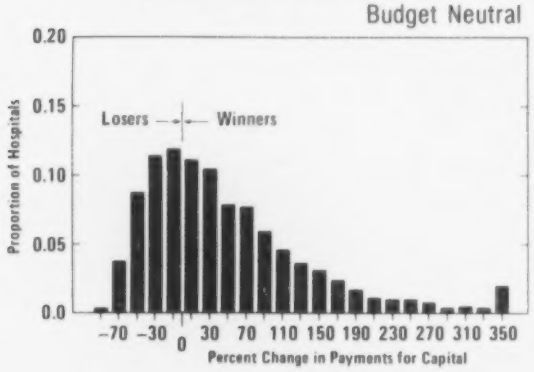
Figure 4.
Changes in Capital Payments
(Prospective payment compared with current law)

20 Percent Reduction



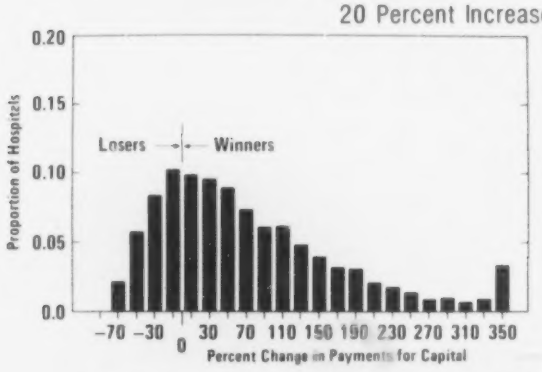
GAINS:	
More than 50 percent	24.5
More than 20 percent	37.3
Any gain	48.7
LOSSES:	
More than 50 percent	15.4
More than 20 percent	37.4
Any loss	51.3

Budget Neutral



GAINS:	
More than 50 percent	37.3
More than 20 percent	51.6
Any gain	62.6
LOSSES:	
More than 50 percent	8.9
More than 20 percent	25.6
Any loss	37.4

20 Percent Increase



GAINS:	
More than 50 percent	48.7
More than 20 percent	62.6
Any gain	72.3
LOSSES:	
More than 50 percent	5.3
More than 20 percent	17.7
Any loss	27.7

SOURCE: Congressional Budget Office calculations based on the 1984 Medicare hospital cost report file.
NOTE: The top interval includes all hospitals with gains greater than 340 percent. The bottom interval includes all hospitals with losses greater than or equal to 80 percent.

here for 1984. There is no way, however, to judge if this is the appropriate reduction.

Moreover, higher or lower payments for capital would be appropriate if demographic or technological changes could be expected to drastically increase or decrease the future needs for hospital inpatient services. But lacking conclusive information on the appropriate level of investment, this study analyzed the effects of immediate implementation under a 20 percent budgetary reduction and a 20 percent budgetary increase.

Setting total prospective payments for immediate implementation at 20 percent less than actual 1984 payments would have reduced the proportion of hospitals receiving more than they would have under cost reimbursement and increased the proportion getting less (see the top panel of Figure 4). Less than half of all hospitals would have received higher payments under immediate implementation, and roughly 15 percent of hospitals would have received less than half of their actual Medicare capital payments.

Under the less likely scenario of immediately carrying out higher total prospective payments for capital, the reverse would have occurred (see the bottom panel of Figure 4). More than 70 percent of all hospitals would have received higher payments in the case of immediate implementation compared with cost-based reimbursement. Only about one hospital in 20 would have received prospective payments that were less than half of their payments under cost-based reimbursement. Note, however, that the losses under prospective payment should not be confused with unreimbursed cash outlays. For example, the hypothetical hospital in Chapter I had capital costs of $200,000 in the first year, but its cash outlays were only $162,745.

HOW WOULD PROSPECTIVE PAYMENT FOR CAPITAL COMPARE WITH PROSPECTIVE PAYMENT FOR OPERATING COSTS?

The change in reimbursement in 1984 that would have resulted from including capital costs in the PPS--if hospitals did not change their

behavior--is modest compared with the change that would have been caused by paying prospectively at the full national rate for operating costs in 1984. The change in payments for capital costs--measured absolutely or as a percentage of total Medicare payments--would generally have been smaller than the corresponding change in payments for operating costs.

To assess the relative magnitude of the two policies--immediately carrying out prospective payment for capital costs and immediately carrying out prospective payment for operating costs--the illustrative PPS in the previous section was used. Hospital capital payments under cost-based and prospective reimbursement were determined by the same method as in the above section.

Since the PPS for operating costs was enacted in 1983 and hospitals were already under it in 1984, estimating payments for operating costs is more complicated. Medicare's 1984 payments for operating costs were based on each hospital's 1982 payments inflated to fiscal year 1984. Similarly, to be consistent with the illustrative PPS, prospective payments for operating costs in 1984 were determined according to 1988 regulations.

Payments under this illustrative PPS for capital and for operating costs were compared with estimated payments under a cost-based reimbursement system. The results are shown in Figure 5. Figure 5(a)--comparable to the figure in the middle panel of Figure 4--shows gains and losses in capital payments expressed as a percent of capital payments. As discussed in the previous section, more than 60 percent of all hospitals would have gained under prospective payment. Figure 5(b) shows that about 60 percent of all hospitals would have gained under immediate prospective payment for operating costs. On the other hand, the magnitude of gains and losses in capital payments--expressed as a percent of capital payments--would generally have been larger than the percentage gains or losses in operating payments. For example, half of all hospitals would have had changes (gains or losses) in capital payments greater than 40 percent compared with only one in seven hospitals that would have had changes in operating payments that large.

The absolute magnitude of the gains and losses in payments for capital costs, however, would generally have been small compared

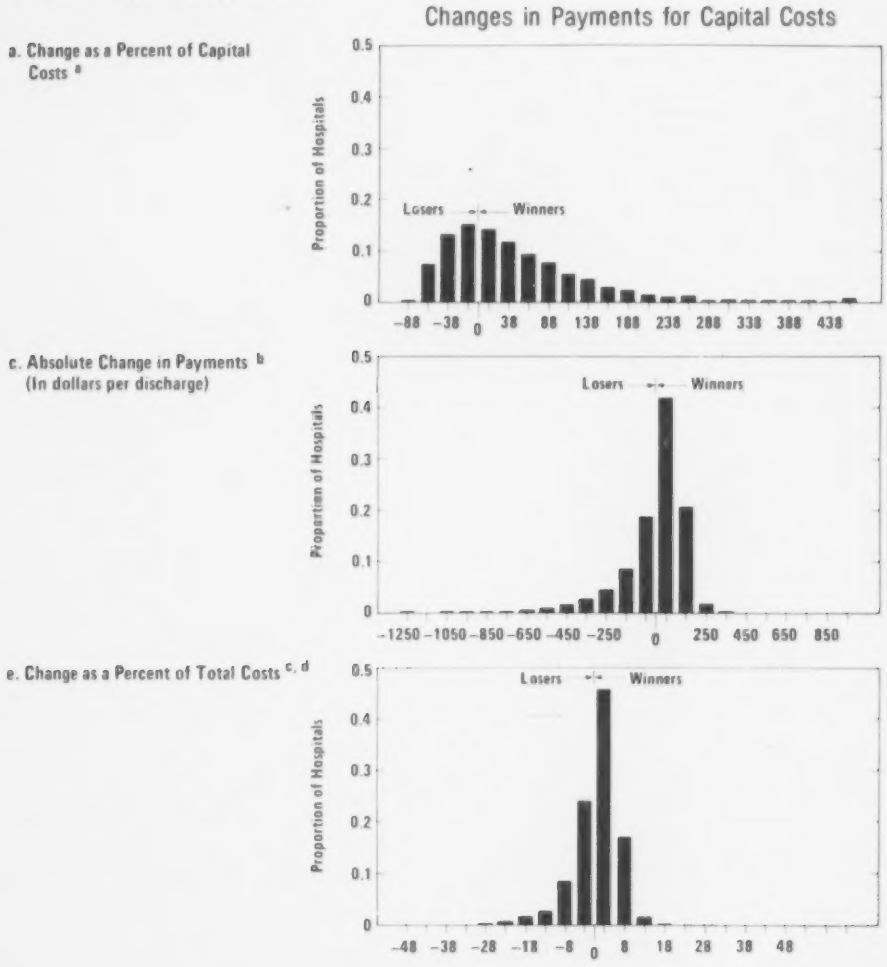
with those for operating costs. Figure 5(c) indicates that most hospitals would have had gains and losses in capital payments that were not very large (as measured in 1984 dollars per discharge). For example, only one hospital in 13 would have had changes in payments greater than $200 per discharge. Figure 5(d), however, shows that changes in payments for operating costs would frequently have been large. For example, two-thirds of hospitals would have had changes in payments for operating costs that were $200 or more for each patient discharged.

The size of gains and losses relative to Medicare's total payments (that is, for both capital and operating costs) would have been smaller if capital costs had been immediately included in the PPS than it would have been if operating costs had been immediately included. For example, only about one hospital in 200 would have gained or lost 20 percent or more of total payments if capital had been included in PPS compared with more than one in three that would have gained or lost an equivalent amount from operating costs being paid immediately under PPS. In fact, more than two-thirds of all hospitals would have had a gain or loss in capital payments that would have been smaller than 5 percent of total payments (compared with less than one in five on the operating side).

These results do not directly address the issue of whether or not hospitals would be able to adjust immediately to prospective payment for capital. First, the change in payments is not comparable to what happened to operating costs under PPS, where payments were only partly based on federal rates in 1984. For this reason, changes under the illustrative PPS are probably much larger than was typical during the first year of PPS. Second, capital costs, by nature, may not be comparable to operating costs. Although the changes in capital payments would be small compared with those for operating costs, that does not necessarily imply that the adjustment would be easier.

These results should be further tempered by two limitations of this analysis. First, the adjustments under PPS--for example, the one for the indirect costs of patient care associated with medical education--were designed for operating rather than capital costs. Therefore, the analysis tends to make capital payments under PPS appear more disruptive than they might be if these adjustments were based on capital costs. Second, the analysis does not account for the positive

Figure 5.
Changes in Payments Under PPS for Capital and PPS for Operating Costs

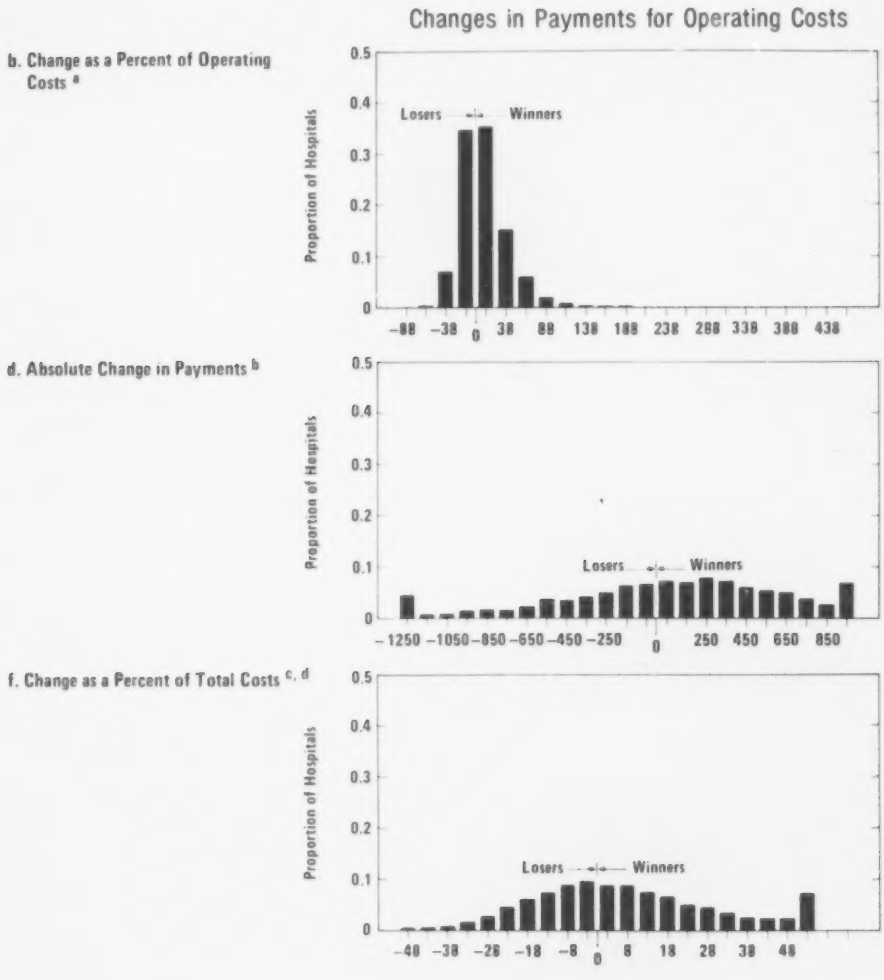

Changes in Payments for Capital Costs
a. Change as a Percent of Capital Costs [a]
Proportion of Hospitals
0.5
0.4
0.3
0.2
0.1
0
Losers
Winners
-88 -38 0 38 88 138 188 238 288 338 388 438
c. Absolute Change in Payments [b] (In dollars per discharge)
Proportion of Hospitals
Losers
Winners
-1250 -1050 -850 -650 -450 -250 0 250 450 650 850
e. Change as a Percent of Total Costs [c, d]
Proportion of Hospitals
Losers
Winners
-48 -38 -28 -18 -8 0 8 18 28 38 48

SOURCE: Congressional Budget Office calculations based on the 1984 Medicare hospital cost report file.

[a] The top interval includes all hospitals with gains greater than 450 percent. The bottom interval includes all hospitals with losses greater than or equal to 75 percent.

[b] The top interval includes all hospitals with gains greater than $900 per case. The bottom interval includes all hospitals with losses greater than or equal to $1,200 per case.

Figure 5. (continued)



[c] The top interval includes all hospitals with gains greater than 50 percent. The bottom interval includes all hospitals with losses greater than or equal to 45 percent.

[d] Total costs are the sum of operating and capital costs.

relationship between gains and losses on the capital and operating components of PPS. For example, hospitals that would have lost payments for capital costs would have lost about $180, on average, in payments for operating costs.

CHAPTER III

GENERAL OPTIONS FOR A TRANSITION POLICY

Although a majority of hospitals would do comparatively well under a PPS for capital, the large losses from immediately including capital costs in the PPS for at least some hospitals might pose a serious dilemma. The choices are to continue with cost-based reimbursement despite its drawbacks, to go ahead with PPS for capital despite any disruption it would cause in the hospital industry, or to proceed with it but provide relief to hospitals that would lose under the new system.

The first option is inconsistent with the intent of the Congress as expressed in the Social Security Amendments of 1983. The second option would, of course, have all the advantages and disadvantages discussed in Chapter II. The third choice--establishing prospective payment for capital costs with some type of transition policy--represents a trade-off between immediate PPS and cost-based reimbursement. The Congress must decide whether or not the relief to certain hospitals from such a transition policy outweighs the loss in efficiency from postponing fully prospective payment.

GOALS FOR A TRANSITION POLICY

One reason for the interest in a transition policy is clearly that some hospitals might be seriously hurt by an unfavorable change in payments for capital-related expenses. Policymakers have additional concerns regarding fairness, efficiency, and fiscal responsibility. In fact, a list of major objectives would include:

- *Effective Targeting*: see that help is given only to those hospitals whose long-run financial health is threatened by an unfavorable change in payments for capital;

- *Efficiency*: minimize incentives that lead to the inefficient use of capital;
- *Fairness:* treat similar hospitals similarly; and
- *Fiscal Responsibility*: pay as little as possible for the transition policy.

Effective Targeting

Including capital costs in the PPS would cause serious financial problems for some hospitals that otherwise would have had no problems, or at least more manageable ones. Effective targeting implies that relief would be given to these hospitals but none of the others. It also implies that each hospital would get just the right amount of relief.

Effective targeting is probably the most important goal for a transition policy. In fact, for reasons described below, such a policy would probably also meet the goals for fairness and fiscal responsibility.

Efficiency

If certain hospitals are relieved of the negative financial effects of immediately incorporating capital expenses in the PPS, they might continue to use too much capital. Therefore, an important goal for any transition policy is to minimize the disincentives associated with cost-based reimbursement. Under an ideal policy, hospitals would have the same incentives as they would if capital costs were immediately included in the PPS.

The goal of efficiency also interacts with that of effective targeting. A transition policy may help the right hospitals--effective targeting--but it could also encourage them to overinvest in capital. In other words, a policy of helping no one might promote the right incentives, but it would not succeed in targeting effectively.

Fairness

Usually a policy is considered to be unfair if individuals in similar circumstances are not treated similarly. The corresponding goal for hospitals is that a transition policy should provide about the same amount of relief for similar hospitals. The definition of similar, however, is not at all obvious. Hospitals may be similar in one respect, but quite different when compared in other areas. For example, two hospitals may have the same capital expenses in 1989, but very different needs for capital in the future.

Fiscal Responsibility

According to CBO's February 1988 Annual Report, the federal deficit is projected to be $176 billion in 1989, or about 3.5 percent of GNP. Especially under these circumstances, an important goal for federal health policy is fiscal responsibility. If two transition policies are equivalent in other aspects, then the one that costs the least would be preferred.

This goal, of course, is closely related to effective targeting and efficiency. For example, fiscal responsibility conflicts with the goal of helping every hospital that would get lower payments under prospective payment, but it supports the goal of providing help only to those hospitals that would not survive without it. Limiting relief to a small number of hospitals would greatly reduce the budgetary impact. On the other hand, the obvious budget solution--no relief for any hospitals--conflicts with the goal of helping hospitals that would face severe consequences from a new payment policy, but would emphasize the increased efficiency of prospective payment.

Even a well-defined list of goals at best provides only rough guidance in evaluating the various transition devices. The goals not only conflict with each other, but they may also be difficult to apply in practice. The choice of a transition device depends critically on the importance of competing goals.

ISSUES IN DESIGNING A TRANSITION POLICY

If the Congress were to establish prospective payment for capital costs, it could choose from any number of alternative transition policies, all of which would provide relief to some or all hospitals whose reimbursements would decline under PPS. The Congress would have to resolve four issues, however, under any transition policy:

- Which hospitals would get relief from losses under prospective payment?
- How much relief would each hospital get?
- When would the transition end?
- Would the relief for losers be paid from the federal general fund or from lower payments to other hospitals?

Deciding which hospitals would get relief and how much should be given is difficult for two reasons. First, no hard and fast rules govern how large a loss any hospital could sustain. Second, offering complete relief for all losses above some specified amount would provide inefficient economic incentives to hospitals with losses above that level. For this reason, many transition policies currently being considered would provide only partial relief.

The choice of when to end the transition and fully incorporate capital costs into the PPS could be based on how long it would take hospitals to adjust to a new payment system. The answer to that question, in turn, relates to how fast the current capital stock depreciates. Moreover, the appropriate adjustment period would be longer if a substantial planning period exists. For example, if a major capital project lasts for 20 years and requires five years to plan and execute, then the replacement facility based on the new payment policy might be as long as 25 years in the future. On the other hand, the transition policy could be based on the average, rather than the maximum, replacement period. Furthermore, an additional downward adjustment could be made for the amount of time since the PPS for operating costs was enacted. This approach could be justified on the grounds that, at the

time, hospitals were warned not to base capital decisions on the cost-based payment system.

The decision of whether or not to have a budget neutral transition policy is different from the decision (discussed in Chapter II) of whether or not a fully established prospective payment system for capital costs should be budget neutral. Every dollar of relief provided during the transition to eligible hospitals under prospective payment would have to come either from the federal general fund or from other hospitals through reductions in their payments for capital. A generous policy for relieving "losers" might be considered too expensive for the federal budget, but a transition policy that is budget neutral because other hospitals would pay for it might be expensive in a different way.

Any reduction in payments to some hospitals means that they would have less funds for future investments. In other words, the adjustment problem would be shifted, at least partially, to other hospitals in the future. This approach might be more acceptable than immediate implementation because administrators of the subsequent group of adversely affected hospitals would have time to plan for the future. On the other hand, most transition policies would encourage some inefficient investment decisions during the transition and would discourage some efficient ones in future years.

The analyses presented in the remainder of this report are based on the assumption of budget neutrality, unless otherwise specified, for several reasons. First, the Congress has repeatedly indicated its intent to design a budget neutral system. Second, the size of the current budget deficit makes it unlikely that general funds would be used to finance much higher payments than are now made. Furthermore, the cuts in Medicare's payments for capital, beginning in fiscal year 1987, make substantial additional budget reductions less likely. Finally, the conclusions from the analysis generally do not change much when different levels of spending are considered.

TYPES OF TRANSITION DEVICES

A wide range of transition devices could be used--separately, or in combination--to alleviate some of the problems that are apt to occur

when prospective payment for capital is carried out immediately. The general alternatives discussed here are:

- Postpone prospective payment;
- Exempt certain hospitals;
- Blend prospective amounts with hospital-specific costs;
- Pay more for exceptionally high costs--that is, for "outliers"; and
- "Grandfather" existing capital--that is, continue to use cost-based reimbursement for capital in place before a specific date.

The classification of transition devices in this section is intended to illustrate the widest range of policies possible. The categories are neither exhaustive nor mutually exclusive. One could argue that almost all policies are variations on blending. For example, grandfather policies blend hospital specific costs and PPS rates with weights depending on the age of a hospital's capital stock. Similarly, outlier mechanisms are merely a more complicated average of hospital-specific costs and PPS rates.

Postpone Prospective Payment for Capital

The Congress could enact prospective payment for capital but postpone carrying it out until some future specified date. This alternative to immediate PPS recognizes the difficulty hospitals face in changing the costs of capital once a project is completed. Hospitals could adjust more easily to a new payment system for capital if they were given several years in which to alter their plans before prospective payment was fully established.

The disadvantages, however, of enacting a prospective payment for capital with some future effective date would be many. First, the Congress would lose the opportunity to put into place the budget control features of prospective payment during the interim. Second, hospitals would have incentives to speed up projects so that a higher per-

centage of costs would occur in years when they would be completely reimbursed. Finally, the Congress has already postponed enacting prospective payment for capital since 1984, and so hospitals have had the opportunity to make some adjustments during this period.

Exempt Certain Hospitals from Prospective Payment

Another simple policy that would provide relief from immediate and universal prospective payment for capital would be to exempt certain hospitals. These exempted hospitals could be chosen by any number of criteria. One obvious choice for exemption would be service to beneficiaries who might lack access to health care if the hospital closed. An alternative policy would be to exempt hospitals that could show especially serious financial problems under prospective payment.

The principal advantage of an exemption policy is that relief could be limited to a small group of hospitals. Although the exempted hospitals would continue to have all the negative economic incentives and resulting higher federal costs associated with cost-based reimbursement, most hospitals would move immediately to prospective payment for capital. The disadvantage of any exemption policy is the "notch problem"--some nonexempted hospitals would almost meet the criteria for exemption. Thus, hospitals that were only slightly different might receive very different payments.

Blend PPS and Hospital-Specific Costs

Under this method, the capital payment to each hospital would be based on a weighted average of the national standardized amount for capital and a hospital-specific amount. The method is analogous to the transition device used under the Medicare PPS for operating costs between 1984 and 1987. The weights could be designed so that the payment would be close to hospital-specific costs at first but would gradually shift to full prospective payment for capital at the end of a transition period. For example, under this approach, in the first year of transition a hospital might receive 80 percent of its actual costs and 20 percent of the prospective payment for capital. Then, in the second year, the hospital-specific portion would decline to 60 percent, and the prospective payment part would rise to 40 percent. In this manner,

the weights would shift 20 percent each year until prospective payment for capital was fully carried out in the fifth year.

The most important single element in designing a blending mechanism is its length--the number of years until payments would be fully prospective. If the proportion of payments determined prospectively were to increase by the same number of percentage points each year, then the length would determine the proportions for blending in each year. The mixture of hospital-specific costs and national prospective rates would not, however, necessarily have to change each year by equal percentage points.[1]

Blending has a major advantage over exempting certain hospitals' capital costs from prospective payment: namely, under blending, actual costs would be only partially reimbursed so that some incentives toward efficiency would be created for all hospitals. Its major disadvantage is that relief would go to all hospitals with actual costs greater than the payments under the national prospective rates, even to those with modest and quite manageable losses. Moreover, incentives for efficiently using capital would be reduced for all hospitals compared with the approach of immediately incorporating capital payments in the PPS.

Make Outlier Payments for Exceptionally High Costs

The financial problems associated with immediately establishing PPS would be greatest for those hospitals whose costs are extremely high compared with the prospective payments. The outlier approach would concentrate relief on hospitals with high losses; most hospitals would move to the prospective system immediately. Those with high capital costs would be reimbursed for all or some part of their costs in excess of the prospective amount. For example, hospitals with capital costs more than 200 percent above the prospective rate could be reimbursed for 80 percent of costs in excess of 200 percent of that rate.

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1. One option, previously analyzed by CBO, would move from 95 percent cost-based in the first year to 80 percent cost-based in the second. After that, the percentage based on cost would decline by 20 percentage points annually--from 60 to 40 to 20 to 0. See Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (March 1988).

Several variations on the basic outlier policy are possible. For example, one approach would be to change each year the level of actual costs at which the outlier payments would begin (the threshold) and the proportion of those costs that would be reimbursed. In other words, start with a low threshold and high proportion reimbursed and gradually increase the threshold and reduce the proportion until prospective payment for capital is fully established. Alternatively, the outlier policy could be made symmetrical with respect to gains and losses--the big winners would lose part of their windfall to pay for the relief given to big losers. But hospitals with low current capital costs would be accumulating smaller windfalls, thereby reducing their ability to meet future capital needs that may be greater.

A major advantage of outlier mechanisms is that most payments to hospitals would be under prospective payment and subject to the previously discussed economic incentives. On the other hand, hospital administrators with moderate losses might argue that they also need assistance during the transition. Some might argue that transition payments should not be concentrated on a group of hospitals that includes those that were the most inefficient in their use of capital.

Grandfather "Old" Capital

Many hospitals have large capital expenses that are the result of decisions made before passage of the Social Security Amendments of 1983. Since some capital expenses are almost impossible to change in the short run, some hospitals might have difficulty in adjusting to a new payment system. Thus, one transition mechanism would be to allow all costs based on commitments before some date in the past--"old capital"--to be exempt from the prospective payment. This approach is similar to blending in that payments would be based on both actual costs and the national rates. Under grandfathering, however, the proportions based on each would not be constant among hospitals.

Without budget neutrality, a simple grandfathering policy could be based on the larger of current costs or the prospective payment for capital costs committed before the cutoff date. Under this approach, no hospital would lose and many would gain. Budget neutrality, however, forces a slightly different concept of grandfathering; payment for old capital would be on a cost basis no matter how large or small the

costs. Hospitals with dilapidated plant and equipment would receive the same as under current law. This amount would be less than under a fully prospective system. These "savings" would be used to pay higher amounts to hospitals with newer--and therefore more expensive--capital than they would receive under prospective payment. Payments for the costs of capital acquired after the grandfathering date would be based only on the new prospective system.

Several variations on budget neutral grandfathering are possible. The national prospective rate for capital could be the same for all hospitals, or it could be designed to pay hospitals with a high proportion of grandfathered capital costs a lower rate than hospitals with little or no grandfathered capital. If the rate were only paid for new capital, the payments would be concentrated on those hospitals with high costs that do not get grandfathered.

On the other hand, the system could be designed so the prospective rate would not decrease as the proportion of old capital costs rose. Since the prospective rate would be smaller under this alternative--to retain budget neutrality--those hospitals with recently completed, high-cost projects would lose more than they would under the former alternative. On the other hand, hospitals with old capital would receive at least some level of prospective payments that could be accumulated for future renovation needs.

The chief appeal of grandfathering is that it would offer complete relief for all the capital costs that could not be altered. Hospitals would make future investment decisions under incentives similar to those that would exist if implementation took place immediately, although their total payments for capital could be quite different during the transition. Presumably, hospitals would alter future investment behavior to minimize heavy losses.

A disadvantage of this type of policy is that, under certain circumstances, reasonable definitions of old capital would imply small prospective payments for new capital, as well as an extremely long transition period before full implementation. For example, if hospital capital has been growing rapidly in the recent past but is expected to be stagnant in the future--as some industry analysts believe--old capital may disappear at a slow rate. Furthermore, a definition of old capital that involves previous commitments to future capital projects could

grandfather all new projects for the first three or four years under the prospective system.

The most serious problem with grandfathering, however, is that hospitals with large capital projects finished before a certain date would be treated quite differently from those hospitals at only a slightly later stage in their capital cycle. Yet, the hospitals with the most recent investments would need funds as much as those completing projects only weeks or days earlier. Of course, some policymakers would argue that hospitals with projects begun after the passage of the Medicare PPS for operating costs would have done so with knowledge that their costs might not be fully reimbursed.

Use Combinations and Variations

Almost any of the policies discussed above could be combined to form a hybrid. For example, under grandfathering, payments for new capital could be a blend of hospital-specific costs and the national prospective amount for new capital. Similarly, outlier policies could be combined with blending to assure that large losses--or both gains and losses--under blending would be partially reduced.

In addition to combinations of devices, other variations on the basic policies could be used. For example, almost any of the transition devices could be modified to treat movable equipment differently from plant and fixed equipment. Adjustment to prospective payment for capital should be much easier for movable equipment with its shorter useful life than for the long-lived plant and fixed equipment. Therefore, a partial solution to the adjustment problem would be to move immediately to prospective payment for movable equipment and either continue cost-based reimbursement indefinitely or use one of the many transition mechanisms for fixed capital.

CHAPTER IV

EFFECTS OF THREE TRANSITION OPTIONS

What are the quantitative implications of including capital costs in the PPS on a transition basis? This chapter examines the implications of three specific options representing some of the broad approaches discussed in the previous chapters. The analysis compares payments under these three transition options with two alternatives--the current system of cost-based reimbursement and the case of immediately including capital costs in the PPS (see Chapter II). Because detailed data on patterns of specific hospital capital costs over a period of time are not available, five hypothetical hospitals with quite different patterns of capital costs were designed.

SPECIFIC OPTIONS FOR A TRANSITION TO PROSPECTIVE PAYMENT FOR CAPITAL

As described in Box 2, the three options to be analyzed are:

- A 10-year blending transition policy;
- An outlier policy with a 125 percent threshold; and
- A policy that grandfathers old capital under cost-based reimbursement.

Two other types of transition devices discussed in Chapter III--postponing prospective payment for capital and exempting certain hospitals--are not represented by specific options. Postponement is not analyzed because its effects would be roughly the same as current law. Similarly, exemption is the same as current law for exempted hospitals; other hospitals would have no transition. Moreover, without a specified rule for selecting which hospitals would be exempt, no further analysis is possible.

BOX 2
THREE SPECIFIC TRANSITION OPTIONS

Blending--10-year transition to PPS. This policy begins with a mixture of 90 percent cost-based reimbursement and 10 percent prospective payment for capital. Each year the mixture changes by 10 percentage points until the tenth year, which is fully under PPS.

Outlier--125 percent threshold for 20 years. Under this illustrative policy, a hospital would receive additional payments whenever its actual capital-related costs were more than 125 percent of the PPS amount for capital. For hospitals with actual costs between 125 percent and 200 percent of the PPS amount, the outlier payments would be set at 60 percent of the difference between actual costs and 125 percent of the PPS amount. Hospitals with costs between 200 percent and 300 percent of the PPS amount would receive 60 percent of actual costs between 125 percent and 200 percent of the PPS amount, plus 80 percent for the amount above 200 percent of the PPS amount. Hospitals with costs above 300 percent of the PPS amount would receive 60 percent of actual costs between 125 percent and 200 percent of the PPS amount, 80 percent for the amount between 200 percent and 300 percent of the PPS amount, and 100 percent for the amount above 300 percent of the PPS amount. For example, if the PPS amount were $400 per case, a hospital with actual costs of $1,350 per case would receive $ 1,050 per case. (This calculation can be illustrated as follows: $400 + 0.6 x ($800 -$500) + 0.8 x ($1,200 - $800) + 1.0 x ($1,350 -$1,200) = $1,050. Under this policy and assuming a PPS amount of $400 per case, the maximum loss is $300 per case.

Grandfathering--September 30, 1988 cutoff date. This method would continue cost-based reimbursement for capital projects that were in service on or before September 30, 1988. Projects begun after that date would be covered under the PPS standardized amount. To maintain budget neutrality, the PPS rate for each hospital would be reduced to reflect the proportion of grandfathered costs to total costs. For example, a hospital with no grandfathered capital costs would receive the full PPS payments, while a hospital whose costs were fully grandfathered would not receive any PPS payments.

Before analyzing the transition options based on the hypothetical hospitals, it is useful to consider how the aggregate payments under each option would compare with prospective payments for capital. The proportion of payments determined prospectively--as opposed to the proportion determined retrospectively or by some other transition device--would vary considerably both between options and over time within the same option (see Table 3). Immediately including capital costs in the PPS, for example, would offer no transition time and would include 100 percent of payments under the PPS during the first, tenth, and twentieth years.

On the other hand, transition policies would compute only a portion of the payments prospectively. The 10-year blending policy would base only 10 percent of payments on the prospective system during the first year. The proportion paid prospectively would increase from 10 percent in the first year, to 50 percent in the fifth year (not shown in the table), and, finally, to 100 percent in the tenth year. On average,

TABLE 3. CHARACTERISTICS OF ALTERNATIVE TRANSITION POLICIES, 1989-2008

	Length of Transition	Percentage of Payments Paid Prospectively			
		20-Year Average [a]	First Year	Tenth Year	Twentieth Year
Current Law	Never	0	0	0	0
Immediate PPS	0	100	100	100	100
Ten-Year Blending	10	73	10	100	100
Outlier Payments	20	88	88	88	88
Grandfathering	[b]	52	11	60	78

SOURCE: Congressional Budget Office calculations.

NOTE: The proportions in this table are based on several simplifying assumptions: no growth in total capital costs; a 20-year average useful life for plant and fixed equipment; a five-year average useful life for movable equipment; and a mix of 40 percent movable equipment and 60 percent fixed equipment.

a. This 20-year average proportion of payments is calculated by computing the ratio of the present value (at a discount rate of 3 percent) of the prospective payments under each transition option to the present value of the payments under immediate inclusion of capital costs in the PPS.

b. Grandfathering would continue until every building and every piece of equipment are fully depreciated.

as measured by the discounted present value, about 73 percent of payments over the 1989-2008 period would be paid prospectively.[1]

The outlier policy would compute 88 percent of payments prospectively each year; only 12 percent would be excluded. Because the outlier policy would last for the entire 20 years, the proportion paid on a prospective basis would be constant.

The transition policy based on grandfathering of old capital would have a longer period of transition than any of the other options. The proportion paid prospectively would increase from 11 percent during the first year, to 60 percent in the tenth year, and to 78 percent in the twentieth year. These proportions are based on the assumption that plant and fixed equipment have an average useful life of 20 years, while movable equipment has an average useful life of five years. Thus, the average paid prospectively over the 20-year period would be 52 percent. Note, however, that the length of the transition depends on assumptions about how fast the capital stock is growing and how long the average piece of capital lasts. For example, if capital were growing at 5 percent each year, then the average paid prospectively over the 20-year period would be 71 percent.

The proportion of payments excluded from prospective payment under any transition policy would depend on the specific characteristics of that policy. For example, the proportion of payments excluded would be less under blending that lasted five years than under the illustrative 10-year option, while the proportion excluded if blending lasted 20 years would be even greater. Similarly, outlier policies that were more generous would remove more payments from the prospective system; less generous outlier policies would remove less. Grandfather policies with earlier cutoff dates would exclude less, while those with later cutoff dates would exclude more.

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1. The discounted present value equals the worth of a future stream of payments in terms of their value now. For a more extensive discussion, see J. Fred Weston and Thomas E. Copeland, *Managerial Finance*, 8th ed. (New York: Holt, Rinehart and Winston, 1986), Chapter 5.

METHODOLOGY

To compare the three transition options, this study analyzed five hypothetical hospitals chosen to illustrate the important effects of each option on specific types of hospitals. The more common approach of analyzing actual cost data was not possible because such data are not available. Moreover, statistics averaged across broad classes of hospitals would obscure the essential differences in how specific hospitals might be affected under any of these options.

Data concerning the capital cycle is necessary to evaluate each transition device. For example, individual hospital data on when future capital projects would be completed is required to evaluate the grandfathering option. The effects of the transition options can best be understood in the context of specific hospital situations.

Assumptions Behind the Analysis

Analysis of the five hypothetical hospitals is based on simplifying assumptions about the economy and organizational behavior. Two distinct sets of assumptions lie behind this analysis. One set deals with the economic environment and the nature of investment activity, and the other concerns the response of investment behavior to an important change in reimbursement policy. The environmental assumptions include:

- *No Inflation or Growth Takes Place.* To simplify the analysis and facilitate comparisons over time, the analysis assumes that the cost of hospital capital goods does not change over time. Furthermore, the amount of real capital per case does not increase either.

- *Fixed Capital is Replaced Infrequently.* All investment for plant and fixed equipment for a specific hospital is assumed to occur at a single point in time. All plant and fixed equipment is assumed to be depreciated over 20 years, although it sometimes can continue to be used subsequently.

- *Movable Equipment is Replaced Continually.* Movable equipment--as contrasted with plant and fixed equipment--is assumed to be replaced continually as it depreciates. Although movable equipment is assumed to have a useful life of only five years, its level at each hospital would remain constant unless the hospital engaged in a major expansion of plant and fixed equipment.

- *Interest Plus Depreciation Costs Remain Constant.* Interest plus depreciation costs are assumed to be constant throughout the useful life of an asset. Although this assumption appears unrealistic given the capital cycle, it helps focus the following analysis on two key components of the variation in capital costs: magnitude and timing. The hypothetical hospitals vary both in the level of their capital costs and in the year in which major renovations occur. These features of the model are more important to the analysis than the variation in interest payments that takes place during the useful life of an asset.

- *Budget Neutrality is Maintained.* Payments under each of the options are designed so that, in aggregate, hospitals receive the same total payments as under the current system--that is, actual costs. (Under current law, 1989 payments are reduced 15 percent below actual costs.)

The major results of the analysis do not depend critically on the simplifying assumptions. In separate sensitivity analyses, the assumptions about inflation, the discount rate, and budget neutrality were relaxed. Inflation was allowed to vary from 0 percent to 8 percent annually, the discount rate ranged from 1 percent to 5 percent, and federal costs were raised 20 percent and cut 20 percent. Variations on each of the transition policies were also examined. Although the specific payments were different in each case, the relationships discussed in this chapter generally were not altered significantly. Major exceptions are specifically noted in the text.

The key behavioral assumption is that hospitals would not, in fact, change their behavior. Without accurate data on how hospitals might respond, this assumption provides a worst-case scenario. To the extent that hospitals are able to and do change their behavior, the var-

iation in outcomes under an immediate PPS would be less than shown here, and consequently the impact of--and need for--the transition alternatives would be reduced.

Description of the Five Hypothetical Hospitals

The five hypothetical hospitals have been chosen to illustrate the strengths and weaknesses of each transition policy:

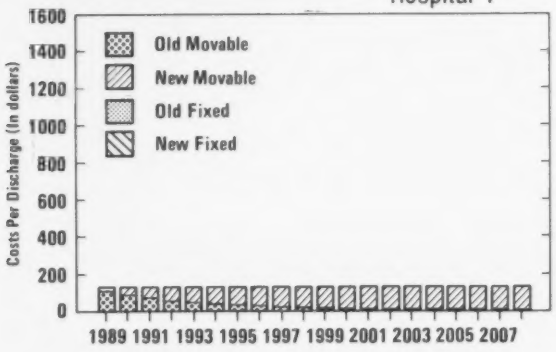
- *Hospital 1--"Low" capital costs with no plans for investment.* This hospital has not completed a capital project for many years and has no plans for one during the next 20 years.
- *Hospital 2--"Medium" capital costs with plans to invest in 10 years.* This hospital has low costs now but will have significantly increased costs in 10 years when it will complete a major renovation project. When costs are averaged over 10 years, Hospital 2 is appropriately classified as having "medium" capital costs.
- *Hospital 3--"Medium" capital costs with major assets that will be fully depreciated in 10 years.* Hospital 3 has high costs now because of a recent major renovation. In 10 years, however, its costs will fall significantly when the major renovation project is fully depreciated. Hospital 3 has identical costs for capital as Hospital 2 if the costs are summed (without discounting) over a 20-year period.
- *Hospital 4--"High" capital costs with a capital project to be completed September 30, 1988.* Hospital 4 will have high costs in fiscal year 1989 because an expensive new facility will be completed on September 30, 1988.
- *Hospital 5--"High" capital costs with a capital project to be completed October 1, 1988.* Except for its completion date, Hospital 4 is identical to Hospital 5.

Hospital 1 would have capital costs of $125 per case in each year between 1989 and 2008 (see Figure 6). The low payments are based on the assumption that its plant and fixed equipment are fully depre-

Figure 6.

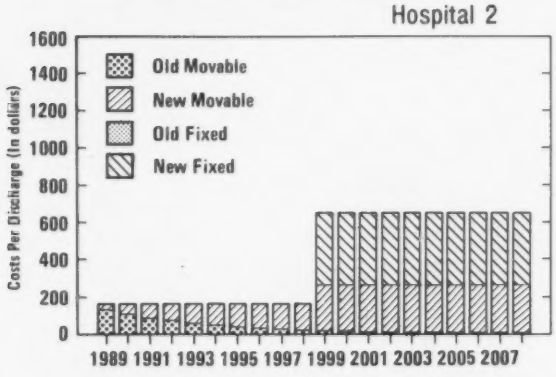
Baseline Medicare Payments for Capital Costs for Five Hypothetical Hospitals

Hospital 1



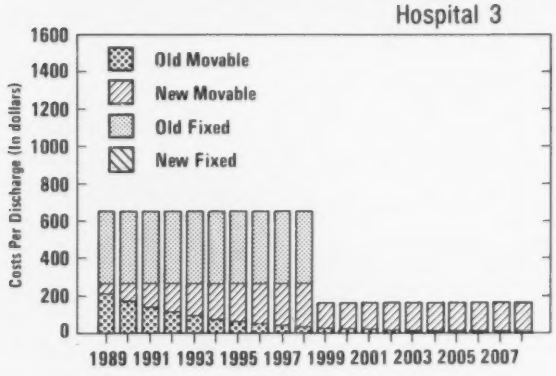
	CAPITAL COSTS		
	Total	Fixed	Movable
1989	125	0	125
1994	125	0	125
1999	125	0	125
2004	125	0	125
2008	125	0	125
Present Value =	1,860	0	1,860

Hospital 2



	CAPITAL COSTS		
	Total	Fixed	Movable
1989	160	0	160
1994	160	0	160
1999	650	390	260
2004	650	390	260
2008	650	390	260
Present Value =	5,491	2,475	3,015

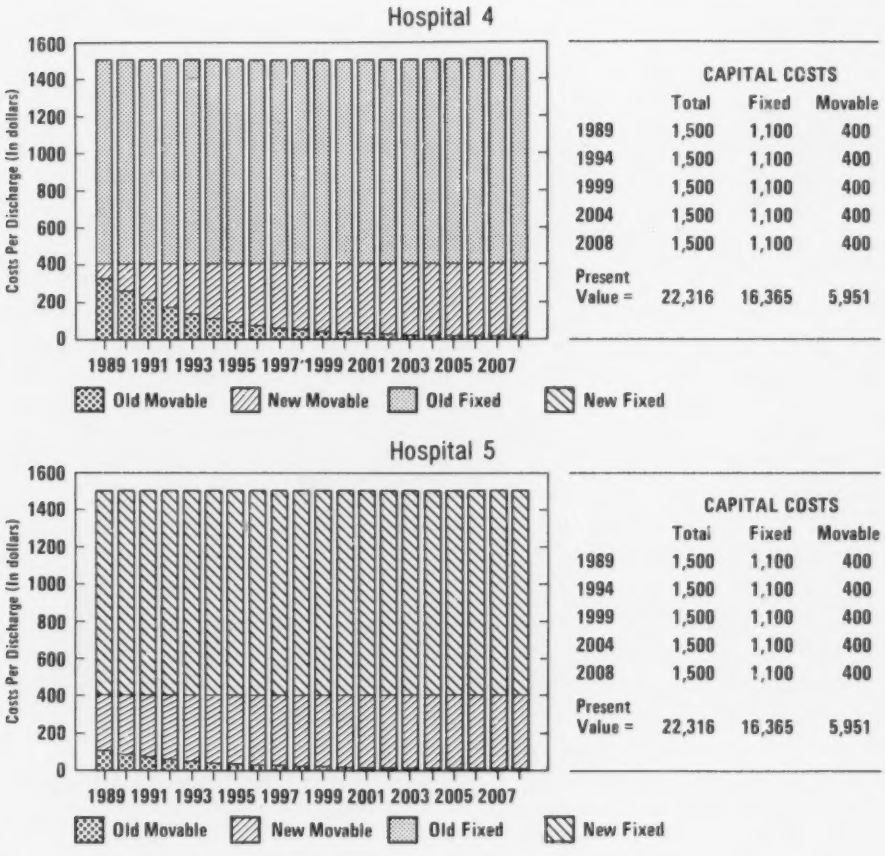
Hospital 3



	CAPITAL COSTS		
	Total	Fixed	Movable
1989	650	390	260
1994	650	390	260
1999	160	0	160
2004	160	0	160
2008	160	0	160
Present Value =	6,560	3,327	3,233

SOURCE: Congressional Budget Office calculations.
NOTE: Totals may not add because of rounding.

Figure 6. (continued)



SOURCE: Congressional Budget Office calculations.

ciated. Usually assets are worn out when fully depreciated. Hospital 1 represents an extreme case in which the plant and fixed equipment are fully depreciated but usable, and the hospital is unable or unwilling to build a new physical plant. The only capital costs facing Hospital 1 would be those associated with movable equipment--$125 per case. By assumption, Hospital 1 would operate for the next 20 years

without replacing its old plant or adding new capacity. The movable equipment would be replaced continually at the rate of 20 percent each year. Twenty percent is the straight-line rate of depreciation consistent with the assumed useful life of five years. Between 1989 and 2008, old costs of equipment (those based on equipment purchased on or before September 30, 1988) would decline from $100 per case to almost zero, while new capital costs (those based on equipment purchased after September 30, 1988) would increase from $25 to almost $125 per case (see Figure 6).

Hospital 2 would have total annual capital costs of $160 per case between 1989 and 1998 and $650 per case thereafter. Its fixed costs, like those for Hospital 1, would be zero at first. In 1999, Hospital 2 is assumed to complete a major renovation project resulting in additional fixed costs of $390 per case based on straight-line depreciation. Hospital 2 would find that its movable costs also would increase from $160 annually between 1989 and 1998 to $260 thereafter. This increase in the real cost of movable equipment is assumed to be the result of upgrading of equipment during renovation. Between 1989 and 2008, capital costs based on equipment purchased before 1989 would decline from $128 per case to $2 per case.

Hospital 3 would have capital costs of $650 per case between 1989 and 1998 and $160 per case thereafter. Its situation is much like Hospital 2 in reverse. Its 1989 to 1998 costs would be similar to those of Hospital 2 between 1999 to 2008, and its 1999 to 2008 capital costs would be similar to those of Hospital 2 between 1989 and 1998. In addition to the difference in timing of costs, Hospital 3 would have much higher costs attributed to old capital than is the case for Hospital 2. Between 1989 and 1998, Hospital 3 has old fixed costs of $390 as well as higher old movable costs compared with Hospital 2.

Hospital 4--completing its renovation on September 30, 1988--would have costs of $1,500 between 1989 and 2008. Both its costs of plant and fixed equipment--$1,100 per case--and its costs of movable equipment--$400 per case--would be constant.

Hospital 5--completing its renovation on October 1, 1988--would have identical capital costs as Hospital 4 between 1989 and 2008. Since old capital is defined as that in place on September 30, 1988,

Hospital 5 would have no old fixed costs and $100 in old movable costs compared with $1,100 fixed and $320 movable costs for Hospital 4.

EFFECTS ON HYPOTHETICAL HOSPITALS

This section compares capital payments under current law with those under an immediate inclusion of capital in the PPS and the three transition alternatives for each of the five hypothetical hospitals. For each of the hospitals, Figure 7 shows each year's payment for capital under the five alternatives. The small table in each panel contains two indices:

- The first column indicates how the hospital fares under each policy relative to cost-based reimbursements as measured by the discounted present value of payments. A discount rate of 3 percent was used. Since inflation is assumed to be zero in the analysis, this rate of 3 percent is roughly equivalent to an 8 percent discount rate with expected inflation of 5 percent.

- The second column indicates how well the hospital fares when compared with the national PPS rate for capital, again using discounted present values. For example, the indices of 282.2 and 88.2 for the outlier policy show that Hospital 1 would get almost three times as much under that policy as under cost-based reimbursement but would get somewhat less compared with immediate PPS.[2]

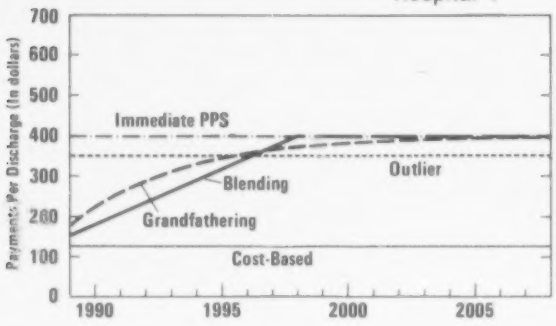
Immediately Including Capital in the PPS

Immediately establishing prospective payment for capital would cause large losses for those hospitals with high capital costs and large gains for those with low costs. Hospital 1, with a very low capital cost per case of $125, would receive $400 per case, or more than three times its cost-based reimbursement in the first year of PPS. (In Figure 7, notice

2. For ease of exposition, the phrase "immediate inclusion of capital costs in the PPS" has been shortened to "immediate PPS." For the same reason, current law payments for capital costs under cost-based reimbursement is referred to as "cost-based." However, it is important for the reader to keep in mind that, under current law, reimbursements are set at 15 percent less than actual costs in 1989.

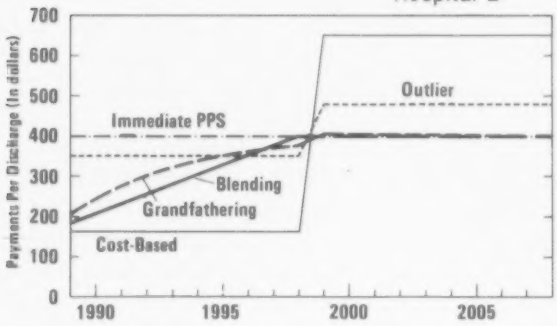
Figure 7.
Medicare Payments for Capital Costs Under Alternative Transition Options

Hospital 1



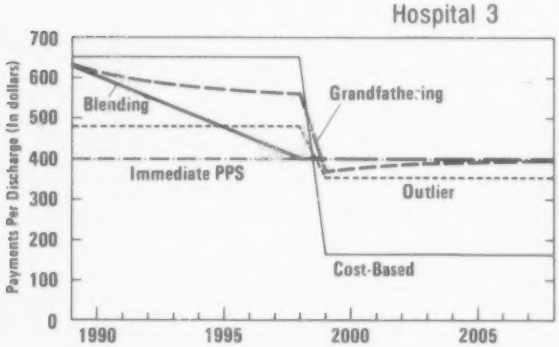
	PRESENT VALUE INDEX (Cost-Based = 100)	PRESENT VALUE INDEX (PPS Rate = 100)
Cost-Based	100.0	31.3
Immediate PPS	320.0	100.0
Blending	260.2	81.3
Outlier	282.2	88.2
Grandfathering	268.9	84.0

Hospital 2



	PRESENT VALUE INDEX (Cost-Based = 100)	PRESENT VALUE INDEX (PPS Rate = 100)
Cost-Based	100.0	92.3
Immediate PPS	108.4	100.0
Blending	90.7	83.7
Outlier	110.1	101.6
Grandfathering	94.7	87.4

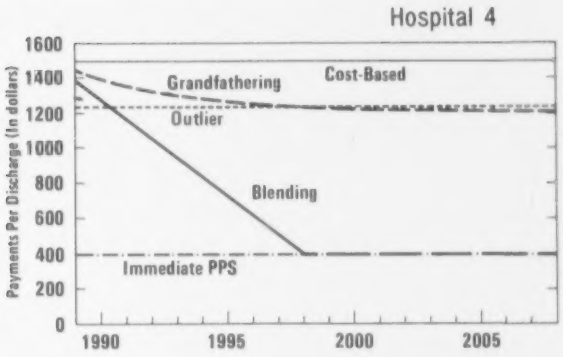
Hospital 3



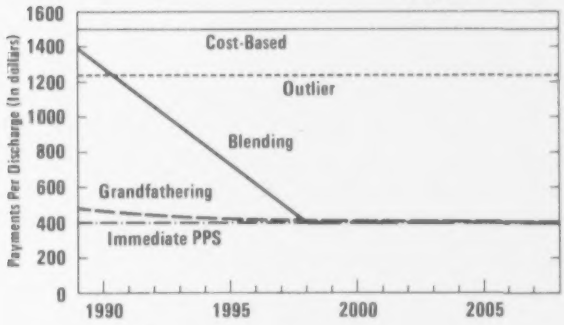
	PRESENT VALUE INDEX (Cost-Based = 100)	PRESENT VALUE INDEX (PPS Rate = 100)
Cost-Based	100.0	110.2
Immediate PPS	90.7	100.0
Blending	106.1	117.0
Outlier	96.3	106.2
Grandfathering	113.6	125.2

SOURCE: Congressional Budget Office calculations.

Figure 7. (Continued)



	PRESENT VALUE INDEX (Cost-Based = 100)	(PPS Rate = 100)
Cost-Based	100.0	375.0
Immediate PPS	26.7	100.0
Blending	46.6	174.8
Outlier	82.4	308.9
Grandfathering	85.0	318.7



	PRESENT VALUE INDEX (Cost-Based = 100)	(PPS Rate = 100)
Cost-Based	100.0	375.0
Immediate PPS	26.7	100.0
Blending	46.6	174.8
Outlier	82.4	308.9
Grandfathering	28.1	105.3

SOURCE: Congressional Budget Office calculations.

the much higher line for immediate PPS compared with the parallel line for cost-based reimbursement.) Hospitals 4 and 5, with an extremely high per case cost of $1,500, would also receive $400, a loss of almost 75 percent (indicated in Figure 7 by index value of 26.7 for immediate PPS compared with 100.0 for cost-based reimbursement).

Hospitals 2 and 3 are intermediate cases. However, Hospital 2 would do slightly better, with a present value index for immediate PPS of 108.4 (compared with 100.0 for cost-based reimbursement), than Hospital 3, with an index of 90.7. Hospital 2 fares better because the surpluses in the early years could be invested for a higher propor-

tion of the 20 years under consideration, at the assumed 3 percent rate of interest.

Blending

At any point in time, the payments for capital under blending lie between actual costs and payments under immediate inclusion of capital in the PPS. Hospitals with high costs do better under blending than under immediate PPS; those with costs lower than the PPS amount do worse compared with immediate PPS.

During the first year of the blending transition policy, Hospital 1 would receive $153 per case compared with $400 under PPS and $125 under cost-based reimbursement. Its per case payment would gradually increase to $263 in the fifth year and finally level out at the PPS rate of $400 in the tenth year. The discounted present value of payments under blending would be 160 percent higher than under cost-based reimbursement between 1989 and 2008, but would represent only 81 percent of payments under immediate PPS (indicated in the first column of numbers in the table of Figure 7 by 260.2 compared with cost-based reimbursement and in the second column by 81.3 compared with immediate PPS).

A surprising feature of blending is that Hospitals 2 and 3--which would have similar costs over the 20-year period--would fare differently. As measured by the discounted present value of payments during 1989 through 2008, Hospital 2 would lose about 9 percent of its cost-based payments under blending compared with a gain of about 8 percent under immediate PPS. In contrast, Hospital 3 would receive 6 percent more under blending compared with a 9 percent loss under immediate PPS.

This result stems from the declining weights associated with blending. In those years when its actual capital costs would be a low $160 per case, Hospital 2 would receive lower payments under blending compared with immediate PPS. Then, between 1999 and 2008, when its costs would rise to $650 per case, the payment for capital would be fully based on the national PPS rate. Hospital 3--with high capital costs between 1989 and 1998--would be helped considerably by higher weights on hospital-specific capital costs in those years. Then,

between 1999 and 2008, when its actual capital costs would be low, the payment would be based on the much higher national PPS rate.

For Hospitals 2 and 3, payments under blending--when discounted over a 20-year period--would not lie between cost-based and PPS payments. Instead, Hospital 2 would do worse and Hospital 3 would do better under blending than under either cost-based reimbursement or immediate PPS. This is an example where assuming no behavioral change can be misleading. Hospital 2, with low costs during the early years of transition to PPS, might change its behavior before its high-cost years after 1997.

Hospitals 4 and 5 would fare identically under blending since they differ by only one day in the capital cycle. The payment for capital would be close to cost-based reimbursement in 1989 and would gradually decline toward the PPS rate between then and 2008. Both hospitals would lose more than 50 percent compared with cost-based.

Even if the length of time for the transition to fully implemented PPS were changed, certain features of blending would not be altered. Hospital 1--whose sum of discounted payments would decrease with the length of transition--would do better under immediate PPS compared with any blending policy. High-cost Hospital 4 and its twin, Hospital 5--whose sum of discounted payments would increase with the length of transition--would do worse under immediate PPS compared with any blending policy. Hospital 2 would receive lower payments under any form of blending compared with Hospital 3.

Outlier Policy

Although all hospitals would receive lower payments under the PPS portion of the outlier payment system--the PPS rate must be reduced by about $50 per case in order to preserve budget neutrality--hospitals with high capital costs would receive additional outlier payments. If both the PPS portion and the outlier payments are taken into account, those hospitals would receive much higher capital payments than under immediate PPS or under 10-year blending.

Hospital 1--with low capital costs and no outlier payments--would be affected only by the across-the-board reduction in PPS rates.

(Notice the parallel line below the PPS line in the Figure 7 graph.) As measured by the discounted present value, its payments under the outlier policy would be 182 percent above cost-based reimbursement and only 12 percent below that for immediate PPS. Hospital 1 would fare better under the outlier policy than under 10-year blending because its own low costs would not enter into the calculation of payments under the outlier policy. This might not be the case if the outlier policy was "balanced"--that is, if payments for hospitals with costs below some threshold were reduced.

Hospitals 2 and 3--with very similar but reversed cost patterns--would fare somewhat differently under this outlier policy. Both hospitals would receive higher payments than under PPS during some years and lower payments during others. (The outlier line, which is parallel to the PPS line, is sometimes above it and sometimes below.) Hospital 2, however, would do slightly better in terms of present value under the outlier policy than it would do under cost-based or under immediate PPS (110.1 under the outlier compared with 101.6 under PPS). Hospital 3 would do worse under the outlier policy compared with cost-based reimbursement but better than under immediate PPS (96.3 under the outlier compared with 106.2 under immediate PPS).

The relative effects of the outlier policy compared with blending would also differ between Hospital 2 and Hospital 3. Hospital 2 would get relief from outlier payments during 1999 through 2008, a period during which its capital payments under the 10-year blend would be based fully on the national PPS rate. Hospital 3, on the other hand, would get more relief from blending during the 1989-1998 period when its costs would be high. During the years from 1999 to 2008 when its costs are low, payments would be higher under blending than under the outlier policy.

Hospitals 4 and 5--with large losses under immediate PPS because of their exceedingly high capital costs--would find their losses cut by almost 75 percent compared with PPS (indicated by the index of 82.4--a loss of 17.6 percent--for the outlier option, compared with 26.7--a loss of 73.3 percent--for the immediate PPS). For these hospitals, the outlier policy would provide much more relief than blending, under which they would lose 53 percent of cost-based reimbursement.

Even though the high-cost hospitals would have much smaller losses under the outlier policy, hospitals in general would be much closer to immediate PPS than the 10-year blend (see Table 3). The principal losers under outlier policies compared with blending would be those hospitals with moderate losses in the early years under immediate PPS--losses that were not large enough to meet the requirement for outlier payments.

Grandfathering

The transition device that would exempt all old capital from the PPS would be the most highly variable of all transition policies in its effects. Hospitals that are similar in many ways could receive quite different levels of payment depending on when their investments occurred.

Hospitals with major increases in costs of capital in place before September 30, 1988, would do much better under grandfathering than those with subsequent increases in capital costs. For example, Hospital 4 would lose 15 percent--as measured by discounted present value shown in Figure 7--compared with cost-based reimbursement, while the otherwise similar Hospital 5 would lose about 72 percent. Similarly, Hospital 2 would lose more than 5 percent compared with cost-based reimbursement, while the otherwise similar Hospital 3 would gain almost 14 percent.

Grandfathering would help hospitals with high costs from projects completed before the cutoff date. High-cost hospitals with major projects completed after the cutoff date and low-cost hospitals with major projects completed before the cutoff date would do worse under grandfathering compared with the 10-year blend or the outlier policy. The high-cost hospitals that are not grandfathered do worse because the PPS payment would be much lower than actual costs; the low-cost ones that are grandfathered do worse because their actual costs would be lower than the PPS amount.

The experience of Hospital 1--which would get considerably more under grandfathering than under cost-based reimbursement--appears to contradict the conclusion. But the hospital has no fixed costs. Since movable equipment rapidly decays, the ratio of new capital to total

capital rises rapidly along with the capital payments. By the third year, Hospital 1 would be receiving 65 percent of the full PPS rate.

APPENDIX

MEDICARE'S PROSPECTIVE PAYMENT SYSTEM

Medicare's prospective payment system (PPS) removed cost-based reimbursement for about 85 percent of participating hospitals and replaced it with a fixed payment that varies depending on the type of case. In practice, predetermined rates are calculated for 473 diagnosis related groups (DRGs). These rates are calculated separately for urban and rural hospitals. They are then adjusted for differences in wage levels in various geographic areas, indirect costs of patient care associated with hospitals that have teaching programs, and costs related to treating a disproportionately large share of low-income patients. Finally, additional payments are made for cases that involve extremely long hospital stays or that are extremely expensive.

DESCRIPTION OF THE PPS

Payments to PPS hospitals are made at a predetermined rate per Medicare discharge for each of 473 DRGs. (Although discharges are classified into 475 different DRGs, only 473 have payment rates associated with them, since DRG numbers 469 and 470 represent cases that could not be easily grouped into appropriate DRG categories.) During the first four years under the system, the DRG rates were based on a combination of each hospital's actual costs in a previous period, regional rates, and national rates. For accounting periods beginning in fiscal year 1988, payments will be based only on national rates for most hospitals. Exceptions are for urban hospitals in two Census divisions, New England and East North Central, and rural hospitals in four divisions--the same two as for urban hospitals, plus the Middle Atlantic and South Atlantic divisions. In these areas, hospitals' payments will be based on a blend of 85 percent national rates and 15 percent regional rates.

The PPS is designed to cover all inpatient operating costs, which include the costs of routine, ancillary, and special care services. On the other hand, payments for capital and direct medical education costs, as well as for bad debt attributable to Medicare patients, are still determined on a retrospective cost basis.

The PPS payments to hospitals are based on four major components: standardized amounts, DRG weights, adjustments for explainable and unavoidable differences in costs, and outlier payments.

Standardized Amounts

The standardized amounts are the system's base prices per Medicare discharge. They are calculated as an average of hospitals' costs per Medicare case in 1981 that have been updated to the current period and "standardized." The regional and national rates for fiscal year 1984 were based on 1981 costs per discharge that were projected based on actual and estimated national increases in hospitals' inpatient operating costs per discharge through fiscal year 1983. The two rates were projected through fiscal year 1984 by a legislated factor equal to the increase in the cost of hospitals' inputs--often called their "market basket"--plus one percentage point. The update factor for the second year under PPS equaled the increase in the market basket plus a discretionary adjustment factor (DAF), legislated to be 0.25 percentage point. The latter process is designed to control for the effects of what are considered explainable and unavoidable differences in costs among hospitals. Sources of differences include the mix of cases among DRGs, local wage levels, indirect costs of patient care associated with teaching programs, and costs attributable to serving a disproportionately large share of low-income patients. Hence, payments per discharge differ among hospitals because of the adjustments for these unavoidable cost differences.

The standardized amounts have been calculated separately for urban and rural areas, and separately based on two types of historical costs--labor and nonlabor components--with the former accounting for about 75 percent of the total. The national standardized amounts for 1987 were as follows:

	Labor	Nonlabor	Total
Urban	$2,159	$812	$2,970
Rural	1,890	560	2,450

Thus, before accounting for differences in case mix and other factors, an urban hospital received about $500 more for each discharge than a rural hospital. Beginning in fiscal year 1988, the standardized amounts are based on discharge--rather than hospital--weighted costs. If that basis had been used in fiscal year 1987, the difference between urban and rural standardized amounts would have been reduced from $500 to $425.

DRG Weights

A key component of the PPS rates is a set of weights that reflect the relative resource intensity, or costliness, of providing care to Medicare patients in each of the 473 DRGs. A hospital's standardized amount is multiplied by the appropriate DRG weight to get the payment applicable to a specific admission. For example, DRG 103--the heart transplant--has a weight of 11.9225. An urban hospital would receive more than $35,000 for this complicated procedure (before other adjustments described below) compared with the urban standardized amount of $2,970. In this way, hospitals receive payments for each patient discharge that reflect, on average, the costs of that specific type of case, as well as the factors that influence their particular standardized amounts.

Adjustments

These amounts--that is, the hospital's standardized amount multiplied by the DRG's weight--are then adjusted to account for a variety of factors:

- *Local Wage Differences.* The payments are adjusted by applying a wage index for the area in which the hospital is located. The index measures the average wages paid by hospitals in that locality compared with the national average of

hospitals' wages. The geographic areas used for the wage index are defined as Metropolitan Statistical Areas (MSAs) for urban hospitals, and all non-MSA areas within a state for rural hospitals. In all, a wage index is calculated for 364 areas--316 MSAs and 48 rural areas (Rhode Island and New Jersey do not contain any areas outside of MSAs). The wage index is only applied to the labor portion of the standardized amount.

- *Indirect Teaching Adjustment.* Hospitals with approved medical education programs receive additions to their payment amounts based on the ratio of number of residents to number of beds. Specifically, rates are increased by about 8 percent for each 10 percent increase in the ratio.

- *Disproportionate Share Adjustment.* Hospitals with a disproportionately large share of low-income patients receive additions to their payment amounts based on an index equal to the sum of the proportion of all patients that are Medicaid recipients and the proportion of Medicare patients that receive Supplemental Security Income (SSI).

Payments for "Outliers"

Payments under the PPS are based on average amounts. As a result, the payment for a specific discharge is only rarely identical to the costs incurred for that case. Ordinarily, an individual hospital bears the risk: it keeps the excess or makes up the shortfall. Certain cases, however, may involve extraordinarily long hospital stays or very high costs relative to the average for the appropriate DRG. For these cases--referred to as "outliers"--the PPS has special payments.

Medicare pays for two types of outliers: "day" outliers and "cost" outliers. Day outliers are those cases with much-longer-than-typical stays for the specific DRG. Cost outliers are cases with extremely high costs relative to the specific DRG's payments. The thresholds that determine which cases are outliers--that is, the length of stay or cost values--are set so that outlier payments account for approximately 5 percent to 6 percent of total PPS payments. The urban and rural

standardized amounts are reduced by the appropriate percentage so that outlier payments are, in effect, budget neutral for these two types of hospitals. The fiscal year 1987 urban and rural standardized amounts were reduced by 5.4 percent and 2.2 percent, respectively, to account for estimated outlier payments.[1]

CALCULATION OF A PPS PAYMENT FOR A HYPOTHETICAL HOSPITAL

Table A-1 shows how the prospective payment would be computed for a specific admission--in this example, a fracture of the femur--to a hypothetical urban hospital. The first panel states that the illustrative discharge is for a fracture of the femur with a DRG weight of 1.4137. The second panel shows that this hypothetical hospital has 300 beds, 30 interns and residents, and a rather high index of low-income patients (0.40). Its wage index of 1.226 indicates that it is located in an area with higher-than-average wages. The next panel shows that the 1987 standardized amounts for an urban hospital were $2,159 for labor and $812 for nonlabor. The final panel shows how to calculate the prospective payment for a fracture of the femur at this hypothetical hospital.

The total PPS payment of $6,009 for this discharge is calculated in five steps:

- The standardized amount for labor ($2,159) is multiplied by the area wage index of 1.226, yielding an adjusted labor amount of $2,647;
- The adjusted labor amount ($2,647) is added to the nonlabor amount ($812), yielding a payment, adjusted for the wage index, of $3,459;
- The amount for the specific diagnosis--fracture of the femur--is calculated as the product of the DRG weight (1.4137) times

1. For a more complete discussion of the Medicare PPS, see Joseph A. Cislowski and Janet Pernice Lundy, *Medicare: Prospective Payments for Inpatient Hospital Services* (Washington, D.C.: Congressional Research Service, 1987).

TABLE A-1. CALCULATION OF THE PPS PAYMENT FOR A HYPOTHETICAL HOSPITAL IN CHICAGO, ILLINOIS

Hypothetical Case	
DRG 235 (Fracture of the femur)	
Discharged on August 18, 1987	
PPS Weight	1.4137
Hypothetical Hospital's Characteristics	
Number of Beds	300
Number of Interns and Residents	30
Index of SSI and Medicaid Patients	0.40
Area Wage Index	1.226
1987 PPS Standardized Amounts (In dollars)	
Labor (Unadjusted)	2,159
Nonlabor (Unadjusted)	812
Calculation of PPS Payment (In dollars)	
Labor (Unadjusted)	2,159
Area Wage Adjustment (1.226 x 2,159)	488
Labor (Adjusted)	2,647
Nonlabor (Unadjusted)	812
Total Labor and Nonlabor	3,459
Payment for DRG 235	
DRG 235 (1.4137 x $3,459)	4,890
Adjustments	
Indirect teaching (0.079 x 4,890)	385
Disproportionate share (0.150 x 4,890)	734
	6,009

SOURCE: Congressional Budget Office calculations of a hypothetical hospital's payment for one DRG under the PPS.

the payment adjusted for the wage index ($3,459), resulting in a payment before other adjustments of $4,890;

- This hospital's resident-to-bed ratio would entitle it to an adjustment of about 8 percent, or $385, for indirect teaching costs; and
- Finally, the hospital would receive 15 percent more, or $734, because it serves a large share of low-income patients--its index of Medicaid and SSI patients is 0.40.

The resulting total PPS payment is $6,009, about twice the sum of the standardized amounts for labor and nonlabor.

COMPARING PPS PAYMENTS AMONG HOSPITALS

Although calculating the payment for a specific discharge helps illustrate how PPS works, it does not provide any information on the range of payments under PPS. For that, payments under PPS were computed for different categories of hospitals and then adjusted for differences in case mix.

Table A-2 shows, for various categories of hospitals, the average payment per discharge for fiscal year 1988 (the first column of numbers) and the distribution of payments per discharge (the next five columns of numbers). For example, the average cost per discharge for all hospitals is $3,493. Five percent of all hospitals, however, receive $2,254, or less, while another 5 percent receive $4,699 or more (see the first row in Table A-2), even after adjusting for differences in case mix.

Payments under PPS are systematically related to certain hospitals' characteristics. Major teaching hospitals, for example, receive two-thirds higher payments per discharge compared with nonteaching hospitals (see Table A-2). In fact, the top 5 percent of major teaching hospitals receive about three times as much per discharge as the bottom 5 percent of nonteaching hospitals. Other systematic relation-

TABLE A-2. DISTRIBUTION OF ADJUSTED PAYMENTS UNDER PPS BY CATEGORY OF HOSPITAL (In dollars for fiscal year 1988)

Hospital Type	Average Cost per Discharge[a]	Percentiles				
		5th	25th	50th	75th	95th
All Hospitals	3,493	2,254	2,451	3,020	3,589	4,699
Urban	3,806	2,937	3,245	3,549	3,988	5,120
Rural Referral Centers	2,931	2,592	2,727	2,853	3,001	3,342
Other Rural	2,466	2,217	2,335	2,435	2,536	2,917
Major Teaching	5,240	3,871	4,675	5,132	5,941	6,676
Minor Teaching	3,836	2,860	3,426	3,752	4,133	5,128
Nonteaching	3,126	2,243	2,414	2,702	3,334	4,083
East North Central	3,567	2,467	2,541	3,211	3,700	4,628
East South Central	2,886	2,190	2,256	2,335	3,030	3,685
Mid-Atlantic	4,169	2,595	3,123	3,621	4,382	6,139
Mountain	3,300	2,067	2,522	2,647	3,333	3,976
New England	3,781	2,466	3,090	3,523	3,910	4,740
Pacific	4,113	2,754	3,363	3,869	4,246	5,349
South Atlantic	3,161	2,255	2,376	2,948	3,276	4,043
West North Central	3,113	2,332	2,386	2,448	2,919	3,757
West South Central	3,076	2,231	2,343	2,591	3,291	3,815
Church	3,540	2,314	2,613	3,271	3,783	4,705
Government	3,216	2,231	2,355	2,487	3,062	4,768
Other Nonprofit	3,612	2,313	2,523	3,190	3,706	4,772
Proprietary	3,319	2,251	2,528	3,205	3,706	4,359
Small MSA (pop. less than 250,000)	3,275	2,751	3,014	3,164	3,395	3,964
Medium MSA (pop. 250,000-1,000,000)	3,553	2,948	3,199	3,407	3,732	4,389
Large MSA (pop. 1,000,000 +)						
Central	4,458	3,213	3,685	4,144	4,837	6,253
Suburban	3,896	3,114	3,464	3,739	4,107	4,912
Rural	2,544	2,219	2,340	2,446	2,576	3,016

SOURCE: Congressional Budget Office simulations based on Medicare cost report files.

NOTES: Hospital payments were adjusted by the case mix index--that is, the average DRG weight--for each hospital.
MSA = Metropolitan Statistical Area.

a. Weighted by discharge. The unweighted average for all hospitals would be $3,139 per discharge.

ships are also apparent: urban hospitals receive higher payments compared with rural hospitals; those in large cities receive more than those in small ones.

Interpreting these differences between hospitals is not straightforward. In theory, the difference in payment between a major teaching and a nonteaching hospital in the same city for the same type of case might be as little as 19 percent. The major teaching hospital, however, is more likely to be in a high-cost, large city compared with the nonteaching hospital, which is more likely to be in a low-cost, rural setting. The large variation in payments per discharge is the result of interaction between the many adjustments under PPS.

GLOSSARY

These definitions were compiled from numerous sources. See the list at the end of the glossary.

Apportionment. See cost apportionment.

Allowable Costs. Elements of cost that are reimbursable, usually under a third-party reimbursement formula. For example, allowable costs under Medicare exclude the costs of such things as new telephones or anti-unionization efforts.

Ancillary Services. Hospital inpatient services other than room and board, and professional services. They may include X-ray, drug, laboratory, or other services not separately itemized, but the specific content is quite variable.

Bad Debt. An uncollectible debt arising from services rendered.

Blending. A transitional prospective payment method that bases a hospital's payment on the average of a federal PPS amount and a hospital-specific amount.

Buildings. The basic hospital structure, or shell, and additions thereto.

Case Mix. The relative frequency of admissions of various types of patients, reflecting different needs for hospital resources. There are many ways of measuring case mix, some based on patients' diagnoses or the severity of their illnesses, some on the use of services, and some on the characteristics of the hospital or area in which it is located.

Capital. A factor of production that consists of produced goods that are used for further production. More specifically, an asset with a life

Capital Costs. Costs associated with the use of capital facilities and equipment, including depreciation and interest expenses.

Capital Cycle. Capital costs are higher for those hospitals with new or newly renovated facilities than for those with older physical plants.

Cost Apportionment. The process of distributing all costs between Medicare and other payers.

Cost-based Reimbursement. Under this arrangement, a third-party payer pays the hospital for the care received by covered patients at cost, not on the charges actually made for those services.

Depreciation. A method of accounting that distributes the cost or other basic value of capital assets over their estimated useful life in a systematic manner. Depreciation for any year is a portion of the total cost that is allocated to that year.

Diagnosis Related Groups (DRGs). A classification system that groups patients according to principal diagnosis, presence of a surgical procedure, age, presence of other significant conditions or complications, and other relevant criteria.

Discharge. A formal release from a hospital or a skilled nursing facility. Discharges include people who died during their stay or were transferred to another facility.

Discount Rate. The interest rate used in the discounting process; sometimes called the capitalization rate.

Discounting. The process of finding the present value of a series of future cash flows.

Fixed Equipment. Sometimes called building equipment. Attachments to buildings, such as wiring, electrical fixtures, plumbing, elevators, heating system, and air conditioning system. Since the useful lives of such equipment are shorter than those of the buildings, the equipment may be separated from building cost and depreciated over this shorter useful life.

Funded Depreciation. Savings accumulated from depreciation allowances and set aside for replacement of capital. Interest earnings on these funds are not offset against interest costs.

Grandfathering. A transitional payment method that is limited to expenses for assets acquired on or after a certain date. Expenses resulting from assets acquired before that date would continue to be paid under cost-based reimbursement principles.

Historical Cost. The charge incurred at the time an item or resource was originally purchased and which is thus not equal to the replacement cost if prices rise in the meantime.

Inpatient Hospital Services. Inpatient hospital services are items and services furnished to an inpatient by the hospital, including room and board, nursing and related services, diagnostic and therapeutic services, and medical or surgical services.

Investment. The flow of expenditures devoted to increasing the real capital stock.

Movable Equipment. Equipment that has a useful life of three years or more and can be moved. This category includes beds, wheelchairs, desks, computers, vehicles, and X-ray machines.

Medicare Hospital Insurance (HI). A program providing basic protection against the costs of hospital and related post-hospital services for individuals who are age 65 or over and are eligible for retirement benefits under the Social Security or railroad retirement systems; for individuals under age 65 who have been entitled to disability benefits under the Social Security or railroad retirement systems for at least 24 months; and for certain other individuals who are medically determined to have end-stage renal disease and are covered by the Social Security or railroad retirement systems.

Medicare Supplementary Medical Insurance (SMI). A voluntary insurance program for aged and disabled individuals who elect to enroll, it provides insurance benefits for physicians' and other medical services in accordance with the provisions of Title XVIII of the Social Security Act. The program is financed by premium payments by enrollees and contributions from funds appropriated by the federal government.

Mortgage. A pledge of designated property as security for a loan.

Operating Expenses. Expenses incurred in the course of ordinary activities of a hospital.

Outlier. A transitional payment method that provides additional payments to hospitals with especially high costs per case. (Sometimes refers to case outliers under the PPS for operating costs.)

Plant. Land, land improvements, buildings, and fixed equipment.

Present Value. The value today of a future payment, or stream of payments, discounted at the appropriate discount rate.

Prospective Payment. Hospital payment programs where rates are set before the period during which they apply and where the hospital incurs at least some financial risk.

Principal. The original amount of capital invested or loaned, as distinguished from profits or interest earned.

Reasonable Cost. An amount based on the actual cost of providing services, including direct and indirect costs of providers but excluding costs unnecessary for the efficient delivery of services covered by the Medicare Hospital Insurance program.

Reimbursement. The dollar amount of medical expenses payable by the Medicare program.

Replacement Cost. See historical cost.

Retrospective Reimbursement. See cost-based reimbursement.

Return on Equity. Medicare reimbursement to a proprietary provider as a payment for equity capital.

Routine Services. Hospital inpatient room and board, and related services.

Salvage Value. Value of a capital asset at the end of a specified period. The salvage value is the current market resale price of an asset being considered for replacement.

Straight-line Depreciation. If the depreciable life is x, then the periodic depreciation charge is 1/x of the depreciable cost.

Transition Device. Any capital reimbursement policy that eventually culminates in fully prospective payment for capital costs, but which reduces the disruption to some hospitals that would ensue from immediately carrying out the prospective payment.

Useful Life. Period of expected usefulness of an asset. Sometimes called "service life."

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